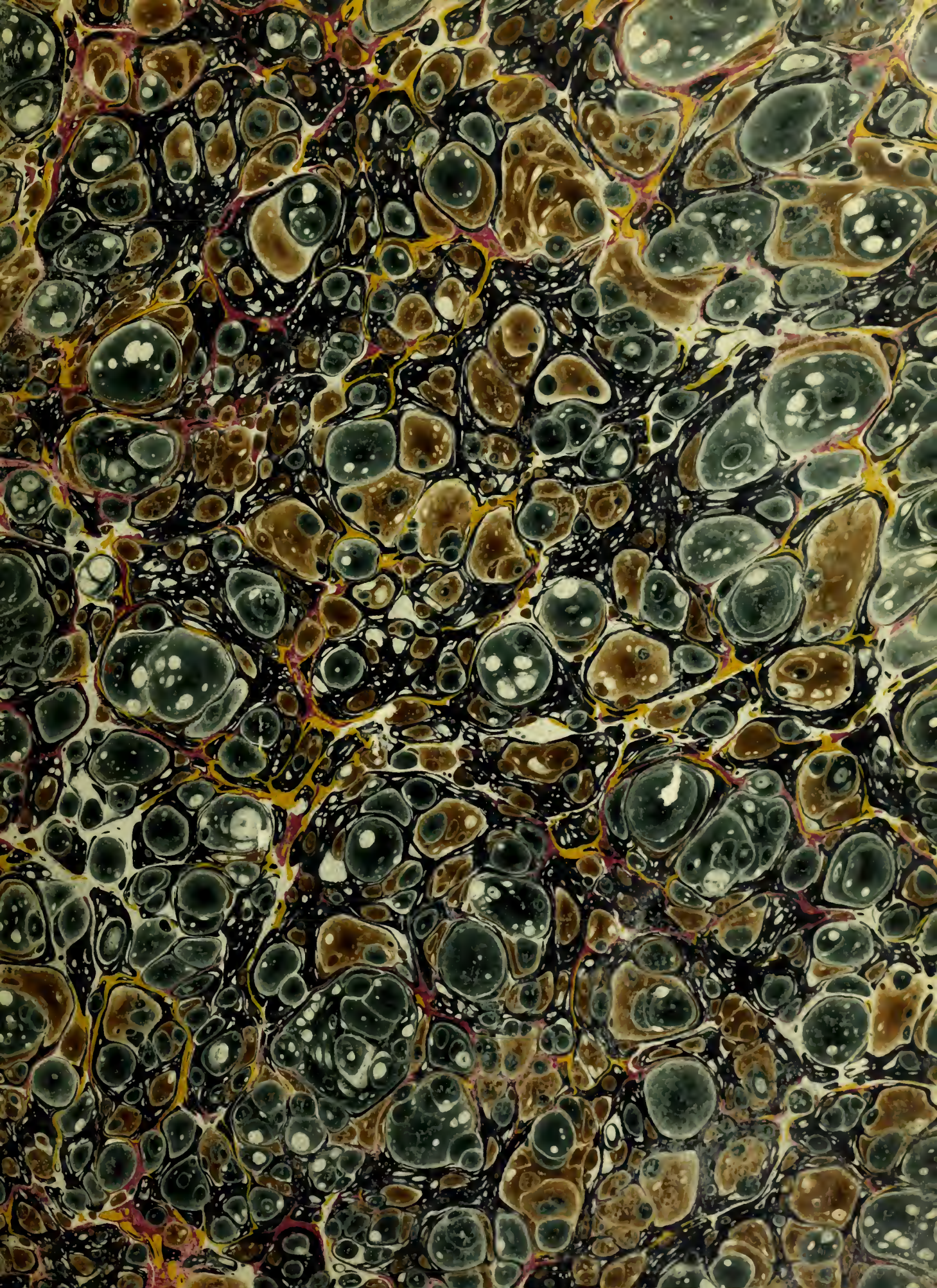



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THE
CYCLOPÆDIA;
OR,
Universal Dictionary
OF
ARTS, SCIENCES, AND LITERATURE.

VOL. XXXII.

THE
HISTORY OF THE
CITY OF LONDON
FROM THE
EARLIEST PERIODS TO THE
PRESENT TIME

THE
CYCLOPÆDIA;

OR,

UNIVERSAL DICTIONARY

OF

Arts, Sciences, and Literature.

BY

ABRAHAM REES, D.D. F.R.S. F.L.S. *S. Amer. Soc.*

WITH THE ASSISTANCE OF

EMINENT PROFESSIONAL GENTLEMEN.

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OF

ARTS and SCIENCES.

SCOTLAND.

SCOTLAND, in *Geography*, an ancient, and formerly an independent kingdom, but now constituting an integral part of the united kingdom of Great Britain and Ireland; is situated, exclusive of its islands, between $54^{\circ} 37'$ and $58^{\circ} 42'$ north latitude, and between $1^{\circ} 47'$ and $6^{\circ} 7'$ west longitude, from London. It is bounded on the south by the Solway frith, and the rivers Esk, Lark, Liddel, and Tweed, which divide it from England; on the east and north by the Northern ocean; and on the west by the waters of the Atlantic. Its greatest length, in a direction due north and south, is 275 miles, and its greatest breadth 147 miles; but its breadth is extremely various, and in one place does not exceed 36 miles. According to calculation, the superficial contents of the mainland amount to 25,520 square miles of land, 494 square miles of fresh-water lakes, and 5000 square miles of salt-water lochs, or lakes. The islands, which are usually classed under two divisions, the Hebrides on the west, and the Orkney and Zetland islands towards the north, comprehend an area of 4224 square miles, so that Scotland, with its lakes and islands, exclusive of its bays, presents a surface of 30,238 square miles. Politically speaking, it comprises 33 counties, which are named in the sequel under the head *Parliamentary representation*, and contains, according to the population census of 1811, 317,763 houses, and 1,805,688 inhabitants.

Historical Events.—The history of Scotland, previous to the union of the two crowns, has been divided by Dr. Robertson into four periods; the first reaching from the most remote ages to the reign of Kenneth II.; the second, from Kenneth's conquest of the Picts to the death of Alexander III.; the third, from that event to the death of James V.; and the last, thence to the advancement of James VI. to the throne of England. The first of these periods, observes the same author, is the region of pure fa-

ble; truth begins to dawn in the second period with a light, feeble at first, but gradually increasing: the events which then happened may be slightly touched, but merit no laborious inquiry. In the third period, Scottish history, chiefly by means of records preserved in England, becomes more authentic; not only are events related, but their causes and effects explained; the characters of the actors are displayed; the manners of the age described; and the revolutions in the constitution pointed out. During the fourth period, the affairs of Scotland were so much mingled with those of other nations; its situation in the political state of Europe was so important; its influence on the operations of neighbouring kingdoms was so visible; that its history becomes an object of attention, not merely to Scotsmen but to foreigners: as, without some knowledge of the various and extraordinary revolutions which happened there, it would be impossible for them to form a just notion with respect either to the great transactions, or the distinguished characters, of the sixteenth century.

After a minute examination of nearly all the works which have been written respecting the early history of Scotland, it is impracticable to unravel the mystery in which it is involved, and to separate authenticated fact from ingenious conjecture. In the present article, therefore, we shall advert to the first periods only in a general way, and shall dilate our narrative, in proportion as events become more certain, important, and interesting.

History of the First Period.—It is agreed by Pinkerton and Chalmers, though on most other points they materially differ, that the aboriginal inhabitants of Caledonia were a colony of the Celtæ, who are generally allowed to have been the first possessors of western Europe. Respecting the era of their arrival in North Britain, and the route by which they reached the country, nothing is known; nor has record,

VOL. XXXII.

B

or

SCOTLAND.

or tradition, preserved to us the smallest trace of their history, till the period of Agricola's invasion, when their descendants appear to have been divided into twenty-one distinct clans, called by the Romans the *Ottadini*, *Gadeni*, *Selgovæ*, *Novantii*, *Damnii*, *Horestii*, *Venricones*, *Taixali*, *Vacomagi*, *Albani*, *Attacotti*, *Caledonii*, *Cantæ*, *Logi*, *Carnabii*, *Catini*, *Mertæ*, *Carnonacæ*, *Creones*, *Cerones*, and *Epidii*.

These various tribes, who are usually mentioned in the Latin writers by the generic name of Caledonians, on the advance of the Romans into their country, united under the authority of Galgacus, one of their most powerful chieftains, to resist their progress. The utmost efforts of valour, however, proved unavailing against the military skill of the great Agricola, and the discipline of the legionary troops. In his first campaign in North Britain, A.D. 80, that celebrated general penetrated, according to Tacitus, as far as the river Tay; and in the year following he constructed a chain of forts between the friths of Clyde and Forth, within which he had retired for the protection of the southern country against the inroads of the free tribes of the North. The summer of 82 was employed in subduing and securing the district which extends from the Solway to the Clyde. Thus freed from the danger of a flank attack, he again passed the Forth, and advanced, without opposition, as far as Loch Leven, establishing, as he proceeded, military posts to keep the inhabitants in subjection. These posts the Caledonians had the hardihood to attack; and by this display of daring intrepidity, seem to have struck great terror into the Roman soldiers. In this dilemma, Agricola divided his army into three bodies, and pushed forward the weakest to Lochore, where he ordered it to encamp, while he stationed the other two at short distances on the right and left. The Caledonians, perceiving the Romans thus separated, made a vigorous attack during the night on the intrenchments at Lochore, and had already entered the camp, when Agricola arrived with the light troops of the other divisions, and, after a furious combat, repulsed the assailants, and forced them to a disorderly and precipitate flight. This victory, though dearly bought, inspired the Romans with renewed ardour; but it did not intimidate the Caledonians, who magnanimously resolved to dispute every foot of ground with the invaders. Agricola consequently found sufficient employment during the remainder of the year in subduing the *Horestii*, the inhabitants of the isthmus between the Tay and the Forth. The following year he advanced to the base of the Grampian mountains, where the Caledonian warriors lay encamped and prepared to receive him. The battle which ensued was contested with the most obstinate valour, but at length terminated in the complete overthrow of the latter. Agricola, however, seems to have derived little advantage from his victory, for after a few days spent in ascertaining the condition of the enemy, he led his troops back to the country of the *Horestii*, and terminated the campaign. The Caledonians immediately advanced, and demolished all the forts in the territories which the Romans had abandoned. Agricola, in the interim, ordered the commander of the Roman navy to sail round Britain, on a voyage of discovery, and with the design of intimidation. This voyage was happily accomplished, by the return of the fleet to the Forth, before the commencement of winter. With these remarkable exploits the campaigns of Agricola terminated; for, having excited the jealousy of the emperor Domitian, by the splendour of his achievements, he was soon afterwards recalled to Rome.

From this period to A.D. 120, the Roman authors are entirely silent respecting the affairs of Britain; but from an incidental expression in Tacitus, some later writers have

supposed that, during that interval, the Caledonians succeeded in recovering the country conquered by Agricola, as far as the Solway on the west, and Tynemouth on the east. This opinion seems to receive some confirmation from the fact, that when the emperor Adrian visited our island in the year last mentioned, he caused a rampart to be constructed between these two estuaries, "which has in every age been a monument of his power, and a memorial of his circumspection." Chalmers, however, contends that this measure was merely precautionary, and that the Roman legions still held all the country south of the Forth and Clyde. The emperor, on his departure, left Julius Severus as his lieutenant in Britain, who does not appear to have attempted any military exploit. Antoninus, who assumed the purple on the death of Adrian, named Lollius Urbicus to the chief government of the island; an officer who equally possessed talents for peace, and a genius for war. Having tranquillized some insurrectionary movements in the south, he carried his arms from the Forth to the Varar, and settled stations in the intermediate country; throwing the whole of that extensive district into the form of a Roman province. Under his directions was constructed the rampart of Antoninus (now called Grimes' dyke), which extends from Caer-riden on the Forth, to Alclud on the Clyde, a distance of thirty-six miles, six hundred and twenty paces. Several military roads, and numerous stations and encampments, were likewise formed in all the provinces, both of North and South Britain. Lollius was succeeded in his government by Calphurnius Agricola, during whose time the Romans abandoned all the country north of Grimes' dyke. Chalmers asserts that this retreat was not the consequence of weakness, but simply of choice. It nevertheless inspired the unconquered tribes with fresh vigour. Breaking through the barriers of Antoninus, they pillaged a large tract within that boundary, and put numbers of the Romans to the sword; but Ulfius Marcellus soon drove them back again into their own territories. They renewed their inroads again in the year 200, with better success; and for some years afterwards seem to have made such progress, as to induce the emperor Severus to assume the government of Britain in person. On his arrival at the head of a larger army than had ever before visited this island, the Caledonian tribes sued for peace, but Severus rejected their proposals. The particulars of his expedition into Caledonia are very imperfectly narrated. It is clear, however, that he penetrated as far to the northward as the frith of Cromarty, though, as Dion assures us, with the loss of no less than 50,000 men. Before he set out, he constructed a wall from the Solway to the Tyne, parallel with the rampart of Adrian, in order to facilitate his retreat in the event of disaster.

On the return of Severus to York, he left his son Caracalla in the government of North Britain; whose conduct is said to have incited the Caledonians to acts of aggression. Irritated at this, the aged emperor issued orders to renew the war, and to spare neither age nor sex; but his death, and the contest for the empire between his sons, seem to have prevented their execution. At all events, it is certain that Caracalla made peace with the Caledonians, and gave up to them all the country northward of the Forth and Clyde. From this period, for nearly a century, we hear nothing respecting the Caledonians, who may therefore be presumed to have made no serious attempts to molest the romanized Britons. At length, however, about the year 306, we are informed that the emperor Constantine found it necessary to come into Britain to repel "the Caledonians and other Picts." This, Chalmers affirms, is the first time the Picts are mentioned in history, and contends that the Caledonians were on this occasion called Picts, "owing to their peculiar seclusion from the

SCOTLAND.

the Roman provincials on the south of the walls." Pinkerton, on the other hand, maintains, that they were a Scythian colony, who had possessed themselves of the eastern coast of Scotland before the Christian era; but his opinion is not supported by evidence or probability.

Constantius having driven back the Caledonians, and other Picts, within their own territories, retired to York, where he died July 25, A.D. 306. Almost forty years elapsed before they were again able to infest the territories of the romanized Britons, though the empire was harassed by civil wars. In 343, however, they made some inroads, but were soon repelled, and the provincials again enjoyed peace for seventeen years. At the close of that period, when Constantine and Julian were contending for the imperial sway, the Scots and Picts made a formidable attack upon the provinces. Lupicinus, an able officer, was sent to oppose them, but does not seem to have effected the object of his mission. This is the first time the Scots are mentioned in the pages of Roman story. Ammianus, in whose work they are noticed, joins them with the Picts, as if they formed one army, though they had no connection whatever by neighbourhood, lineage, or interests: they were, in fact, an erratic people of Ireland, who were much accustomed to naval predatory excursions against the Roman provincials during the fourth and fifth centuries, but they had no territories in North Britain till about the year 503, as will be more particularly noticed in the sequel. The next attack upon the Roman provinces by the Picts and Scots happened in the year 364, and seems to have been more general and destructive than any former incursion by either of these people. For three years they continued gradually advancing towards the south, spreading death and desolation wherever they came. At length Theodosius, the most distinguished general of his age, was sent into Britain by the emperor Valentinian, to put a stop to their ravages and to restore tranquillity. In two campaigns he drove the Scots from the island, and the Picts beyond the wall of Antonine, which he repaired, and strengthened with additional forts, and constituted the territories within it into a province, by the name of Valentia. Such, indeed, was the energy of his operations, and the wisdom of his precautionary measures for the maintenance of peace, that the Scots and Picts did not dare to renew their aggressions till the year 398, and even then they were easily repelled. The Roman empire, however, was now rapidly on the decline. In 407, the revolt of the troops in Britain transferred the government to Gratian, and after his death to Constantine, who conveyed the army with him into Gaul. The British provincials, thus left in a manner to themselves, assumed a sort of independence, which was sanctioned by the emperor Honorius, who, conscious of his inability to protect this distant part of the empire, directed the British cities to rule and defend themselves. "But," to quote the words of Chalmers, "their inexperience soon occasioned them to feel their own weakness. And in A.D. 422, though the walls were then garrisoned by Roman troops, the provincials again applied for additional protection against the desultory attacks of a predatory people, who could be more easily repelled than tranquillized. A legion is said to have been sent, who chastised the invaders, and, for the last time, repaired the fortifications that had long overawed the Pictish tribes. From this epoch the provincials enjoyed twenty years' repose. The year 446, when Ætius was consul for the third time, is the memorable epoch, when the British provincials acknowledged themselves to be Roman citizens, by their supplication to that able supporter of a degenerate state for fresh assistance; but he was unable to gratify their desire, owing to the pressure of the barbarians upon Gaul. The

provincials were again told, in a more desponding tone, that they must rely on their own efforts for their future government and effectual defence. The abdication which Honorius seemed willing to make in A.D. 409, Ætius thus more completely effected in A.D. 446." Caledonia, vol. i.

After the final departure of the Romans, North Britain was occupied by two races of men, the Picts, and the romanized Britons of the province of Valentia. The latter, some authors contend, united themselves under one ruler to resist the inroads of the Picts, and thus formed the kingdom of Cumbria, or Strathclyd. Of the existence of such a monarchy, however, within the limits of proper Scotland, there is much room to doubt. At all events, it is very improbable that this new nation was able to confine the Picts within their ancient boundaries. On the contrary, it is most likely that the Picts, in conjunction with the Scots from Ireland, conquered and occupied the greater part of Valentia. At a later date, the Anglo-Saxons of Northumberland possessed themselves of the eastern coast of that province; but it does not appear certain that the Lothians ever were integral portions of the Northumbrian or Bernician monarchy; though they might be for a time annexed to it by temporary conquest from the Picts. See STRATHCLYD.

Several ancient Scottish writers, upon the authority of monkish legends, contend that their ancestors first settled in Argyle 330 years before the Christian era; and they give a list of kings, and a narrative of their actions, from that remote period. Later investigations, however, have shewn that these details are most probably fictitious, and that the Scots did not colonize any part of present Scotland till the year A.D. 503, when a body of them passed over from the north of Ireland, their proper country, and fixed themselves in the district of the British Epidii, which they denominated Caentir. These colonists were led by Loarn, Fergus, and Angus, the three sons of Erc, a chieftain or petty king of Dalriada, viz. the portion of Rhiada in Ulster, whence the Scots were sometimes called Dalriads. The derivation of the name Scot is uncertain, but the most plausible opinion is, that it was a corruption of the word *scelte*, which signifies in Irish dispersed or scattered, and was therefore applied generally to denote the roving tribes who had habituated themselves to maritime excursions against the western shores of romanized Britain.

Chalmers justly observes, that there scarcely occurs a period of history so perplexed and obscured as the annals of the Scoto-Irish, from the date of their settlement in Argyle, till their ascendancy over the Picts in 843. This confusion and obscurity originated in the want of contemporaneous writings, and were afterwards greatly increased, by the contests of the Irish and Scottish antiquaries for pre-eminence in antiquity as well as in fame. In the sister island, however, there have happily been preserved various documents, particularly the annals of Tigernich and Ulster, which throw many flashes of light on the transactions of that dark era. Several brief chronicles and historical documents, calculated to elucidate the same subject, have likewise been brought into notice by Innes; and Pinkerton first published a Gaelic poem, which professes to give a genealogical account of the Scoto-Irish kings. From an attentive consideration of all these, and from an accurate examination of other documents, Chalmers compiled his genealogical and chronological table of the Scottish monarchs, to Kenneth inclusive, from which it appears that they were twenty-nine in number, and occupied by their united reigns a period of 340 years. The first was Fergus, who became sole chieftain, or king of the new colonists, soon after their arrival. He died in 506, leaving his power and pretensions

SCOTLAND.

to his son Domangart, who reigned five years, and then transmitted his dominions to his eldest son, Comgal. This prince enjoyed his sovereignty twenty-four years, during which time he had leisure to extend his dominions and consolidate his authority. Dying in 535, he was succeeded by his brother Gawran, to the exclusion of his own son, Conal. Gawran reigned twenty-two years, and engaged in a war against the Picts, which terminated in his defeat and death. Conal then obtained the sceptre, and held it for fourteen years. Aidan, the son of Gawran, next claimed it; but Duncha, the son of Conal, opposed his pretensions. The bloody field of Loro, in which Duncha fell, put an end to the dispute, and gave Aidan possession of the crown. He was inaugurated by St. Columba in 574, on the holy island of Jona; and proved himself, throughout a reign of thirty-five years, to be a prince of great enterprize. He extended his dominions along the western coast of Valentia, which had been seized upon and colonized by various tribes of "Sceites" from Ireland, by consolidating the whole of them under his superior sway. In 577, having advanced into Cumberland, he engaged Rydderch, king of Cumbria, but the battle seems to have been indecisive. He afterwards entered into a league offensive and defensive with the Cumbrian monarch against the Saxons, who were defeated with great slaughter at Stanmore, in Westmoreland. Buchanan asserts this was a league as well against the Picts as the Saxons, and further intimates, that Aidan was monarch of the district, now included in the counties of Renfrew, Ayr, Wigton, Kirkcudbright, and Dumfries; and this view of the subject certainly bears the stamp of greater probability than the opinion which confines his territories to the isthmus of Cantire and the neighbouring islands. Aidan, according to all the writers who treat of his reign, fought several battles against the Saxons, in most of which he was victorious; but in the year 603, he was completely defeated by Ethelfrid, king of Northumbria, at the battle of Dawlsane, in Roxburghshire. This disaster, joined to the death of St. Columba, his kinsman and friend, so much affected him, that he died in the second year thereafter, at the advanced age of eighty, and was buried in the chapel of Ciaran at Campbeltown. The successor of Aidan was Eocha-bui, called by Buchanan Eugenius, who, according to Chalmers, carried on a successful warfare against the Cruithne of Ireland; but the Scottish historian mentions only that he harassed the Picts and Saxons by continued incursions. Eocha died in 621, and had for his successor Kenneth the Aukward, his son. This prince is said to have prosecuted the Irish war begun by his father with great vigour, till his death, which happened in the unfortunate conflict of Fedhaevin, when he had scarcely reigned three months. Ferchard, the son of Eogan, of the race of Loarn, next obtained the throne. Chalmers says he reigned sixteen years, but left no events for history to recount. Buchanan, however, affirms that he was a great tyrant, and that the nobility, irritated at his oppressions, and at the circumstance of his embracing the Pelagian heresy, conspired against him, and threw him into prison, where he laid violent hands on himself. His successor was Donald, who, as Chalmers informs us, invaded Ireland with an army composed of Scots, Picts, Britons, and Saxons, but was totally defeated on the plain of Moyrath in 637, and compelled to seek shelter in Cantire. Donald, however, continues our author, derived no wisdom from this disaster, for in the following year he attacked the Picts, and was again overthrown with great slaughter. He was ultimately slain at Straith Carmac, by Hoan, one of the reguli of Strathclyd, in the year 642. Such is the history of Donald, as given by Chalmers, but not a word on the subject either of Irish or

Pictish wars occurs in Buchanan. By that historian, on the contrary, he is represented as an excellent man, the protector of Oswald, afterwards king of Northumberland, during the misfortunes of his early life, and his assistant in more fortunate times, in the propagation of the Christian religion among his heathen subjects.

From this period to the year 736, the events of Scottish history are so involved and so unimportant, that we shall pass them over in silence, remarking only, that nine kings reigned in the interval, whose names are thus recorded by Chalmers: Conal II., Donal-duin his son, Mal-duin, Ferchard, Eocha-rineval, Ainbhceallach, Selwach, Eocha III., and Muredach. The last monarch had been unwillingly drawn into hostilities with the Picts, and transmitted their enmity to his successor, Eoghan, or Ewan, a feeble prince, who died in 739, when Aodhfin seized the sceptre, and soon evinced himself equal to the arduous task of government, even in the most troublesome times. In 740 he boldly encountered the mighty Ungus, king of the Picts, and forced him to quit his territories. Aodhfin died soon after, having reigned with greater glory than any of his predecessors, for the long period of thirty years. He left his kingdom, but not his talents, to his son Fergus, who reigned about three years, whilst that of his successor, Selvach II., lasted twenty-four years. The government of Eocha IV., or as he is called by Buchanan, Achaius, the next king, was marked by several important transactions. Some authors assert that he formed an alliance with Charlemagne, and instituted the most ancient order of the Thistle, but both these statements are erroneous. It is true, however, that he entered into a treaty of great importance to himself, his children, and his country, for he made peace with the Picts, and received the hand of Urgusia, daughter of Urguis, and sister of Constantine and Ungus, all of which in succession swayed the Pictish sceptre. Eocha died in 826, after a reign of thirty years. Buchanan says, that the successor of Eocha was Congallus, but Chalmers makes no mention of this monarch, asserting that Dungal, the son of Selvach II., obtained the throne on the death of Eocha. He died in 833, when Alpin, the son of Eocha and Urguis, was acknowledged king. Chalmers, who does not admit the Scottish monarchs to have possessed, even in this reign, any territories beyond the district of Cantire, and the disputed tracts of Argyle and Lorn, states that Alpin, ambitious of reigning over richer people and more extensive domains, landed on the coast of Ayr in 836, and penetrated a considerable way into the country, but was at length defeated and slain near the scite of Laicht castle, on the confines of Galloway. Buchanan, on the other hand, asserts that Alpin fell in a battle fought near Dundee against the Picts. Kenneth, the son of Alpin, next succeeded to the throne, and waging war against the Picts, after several obstinate battles overthrew their government, and united the two rival monarchies into one kingdom, under the name of Scotland, an event which brings us to the close of the first period of Scottish history.

History of the Second Period.—Kenneth, having thus accomplished the union of the two kingdoms, endeavoured by every means in his power to render that union permanent. He enacted many excellent laws for the better administration of the government, and removed the stone chair in which the kings of Scotland were wont to be crowned from Argyle to Scone. After a reign of twenty-three years, sixteen of which he ruled over his new monarchy, he died in 854, when Donald, his brother, was proclaimed king. This prince relaxed the public discipline established by his predecessor, and gave himself up to the most shameful excesses. The Picts rose in open rebellion against his authority,

SCOTLAND.

thority, and formed alliances with Osbreth and Ælla, monarchs of two of the Anglo-Saxon kingdoms adjoining Scotland. These princes entered Merch with a powerful army; and from thence dispatched heralds to Donald, requiring him to re-establish the Pictish monarchy. Donald, roused by a sense of his danger, marched against them, and totally defeated their united forces on the Jed, a river of Teviotdale. This victory enabled him to recover Berwick and all the territory to the north of the Tweed; but his success was of very short duration, for having indulged too far the natural licentiousness of his troops, the English took advantage of their carelessness, set upon them in the night, routed them with great slaughter, and made Donald prisoner. The enemy afterwards advanced to the Forth, which they attempted to cross in ships, when a violent storm arose, and occasioned the wreck of half of their fleet. This event so weakened their forces, that they were induced to conclude a peace with the Scots, upon the condition of their abandoning all the country southward of the Forth and Clyde. Of the Picts nothing was said in the treaty, and hence most of them, deceived in their hopes, passed over into Denmark and Norway. Donald, having returned from captivity, still continued his voluptuous conduct, which so exasperated the nobles, that they committed him to prison, where he laid violent hands upon himself in the year 858. Such is the account of Buchanan; but Chalmers speaks of him with praise, and says that he died at the palace of Balachoir in the year 863, and was buried at Icolm-kill.

Constantine, son of the great Kenneth, now mounted the throne. Being a prince of great valour and lofty spirit, says Buchanan, he was anxious to eradicate the ignominy which Donald had brought upon the kingdom, and to recover the territories he had lost, but his nobles dissuaded him from the attempt. He therefore directed his attention to the reformation of the public morals, particularly those of the military and priesthood. In this reign the Danes invaded Scotland, by landing a large army in two divisions in the isthmus of Fife. Constantine hastened to oppose them, and fortunately overthrew one division before the other could arrive to its assistance. Upon this, the rest of the Danes retreated to an entrenched camp, which they had constructed near their landing place. The Scots, flushed with victory, too rashly assaulted the Danish works, and were defeated with the loss of their king and half their army. The Danes, however, had suffered so much, that notwithstanding this success, they immediately re-embarked for their own country.

Othus, or Aodh, brother to Constantine, succeeded him in the regal dignity. His reign was short and disturbed by rebellion; and terminated, according to Chalmers, in consequence of a wound received in the battle of Strathal. Buchanan, on the other hand, asserts that he was thrown into prison by the nobles for his tyrannical and licentious conduct, and that he died there before he completed the first year of his reign. Gregory, or Grig, who next reigned, emulated the virtues and achievements of the great Kenneth. While his internal policy was mild and just, he rendered himself feared and respected by foreigners. The Danes having seized from the English the greater part of the country south of the Forth, he drove them out of it, and once more established the Solway and the Tyne at the northern boundary of Scotland. He afterwards defeated the English, who had entered the western district of the kingdom, and compelled them to give up Cumberland and Westmoreland to the Scots. Gregory afterwards landed in Ireland, and having defeated the Irish in a battle fought on the river Bann, advanced

to Dublin, which surrendered without resistance. Here he found king Duncan, then a minor, with whom he concluded a peace, and immediately returned to his own dominions, where he died in 892, greatly regretted by his own subjects. Such was the life of Gregory, as represented by the Scottish historians; but the researches of Chalmers have discovered that instead of being a hero and a conqueror, he was a man of unprincipled morals, an usurper, and a hypocrite; and was driven from his throne by the indignation of his people. Gregory was succeeded by Donald, the son of Constantine, during whose reign the Danes made several descents upon Scotland, but were, in every instance, repulsed. Chalmers informs us that the king fell, gallantly fighting in defence of his kingdom against a body of these invaders, who had penetrated almost to the Scottish capital. Buchanan, on the other hand, states that he died during an expedition to quell a feud betwixt the Rossians and the Merch-men; and Boethius asserts that he expired in Northumberland in 903. His successor was Constantine, the son of Aodh, the early part of whose reign was equally disturbed by the inroads of the Danes. He afterwards engaged in a war with Athelstan, king of England, who ravaged all the country as far as the Forth and Clyde, and forced Constantine to sue for peace. Constantine, however, only observed it till an opportunity for revenge occurred, and then, joining with Anlaf, one of the most powerful of the Anglo-Danish princes, their united forces sailed for the Humber, and disembarked without opposition. Athelstan, who had foreseen and prepared for this event, soon came up with the invaders, and after a battle, till then unexampled in the English or Scottish annals, gained a complete victory, and Constantine and Anlaf only saved the remains of their army by a speedy re-embarkation. In this action Constantine having lost his son, and most of his nobility, resigned the kingdom in favour of Malcolm, the son of Donald, and retired to a monastery at St. Andrews, where he ended his days. Soon after the accession of Malcolm, the conquered provinces of Cumberland and Westmoreland revolted from the English monarch, who, fearful of his ability to retain them, agreed to surrender both to the king of Scotland, on condition, as Buchanan states, that Malcolm and his successors would acknowledge they held them of the crown of England, in fealty; the condition was accepted, and Malcolm passed the remainder of his reign in reforming the administration of justice, and the licentious character of his subjects. With this view he made a tour through the whole of his dominions every two years, and is stated to have been paying his last biennial visit to the north, when he was assassinated in Moray, in the fifteenth year of his reign. His successor was Indulfus, who formed an alliance with the English, and enjoyed peace during the first seven years of his rule. At length the Danes unexpectedly disembarked in Lothian; the Scottish king marched and gave them battle, overthrew them with great slaughter, but unfortunately perished himself in the ardour of pursuit.

Duffus, the son of Malcolm, next swayed the sceptre, and appointed Culenius, the son of Indulfus, governor of Cumberland. This monarch having held the reins of government with a firm hand, many of his nobles rose in open rebellion against the royal authority. By his vigorous measures, however, he was enabled to crush the insurrection, and to bring the leading offenders to punishment. He afterwards directed his endeavours to crush the banditti who infested the counties of Moray, Ross, and Caithness. Many of these were slain in various skirmishes, but the principal of them were secured and brought to the town of Forres, in
order

SCOTLAND.

order to render their fate more exemplary. Here the king was assassinated by the governor and his wife, who had vainly interceded to save some of the criminals, their relations.

Culenus, the son of Indulfus, now mounted the throne; and immediately instituted an inquiry into the murder of his predecessor, and visited with condign punishment all who were concerned in that tragical event. But with these acts the merits of his reign cease, for scarcely had the executioner performed his duty, before the king abandoned himself to every species of vice, and gave equal licence to the younger nobility. Having been, in consequence, summoned to answer for his conduct in an assembly of the states convened at Scone, he was assassinated on his journey thither by the thane of Methven, whose daughter he had injured. Culenus was succeeded by Kenneth, the brother of Duffus, a man in every respect the reverse of him in character and conduct. His first object was to put an end to the abuses of the former reign; which he had scarcely accomplished, when the Danes, made a descent on Aberdeenshire, and pillaged the country as far as the town of Perth, to which they laid siege. The king hastened to give them battle, and after an obstinate and bloody contest, was defeated and put to flight. This disaster being perceived by the chief of the clan, Hay, he, and his sons and vassals, placed themselves in a narrow pass, through which the main body of the Scots fled, and by their exhortations and courageous conduct, succeeded in changing the fortune of the day. The Scots turned upon their conquerors, and after a second rencounter, still more furious than the first, gained a complete victory. The gallant Hay was rewarded with extensive estates, and raised to the dignity of nobility, which is still enjoyed by his descendants. From that time peace continued for several years, during which period Kenneth attempted to regulate the succession to the royal dignity, so as to render it hereditary in his own family. In the pursuit of this object he committed the only crime with which his reign is stained, the murder of Malcolm, the son of king Duffus, who was considered by the nobility as the next successor to the throne. All his efforts, however, proved unsuccessful; for though he obtained a vote of the states in favour of his views, yet when the throne became vacant by his death, which happened in the year 994, Constantine the Bald was proclaimed king. Malcolm, Kenneth's son, collected a large body of troops to assert the preference of his rights, but on the approach of the royal troops he dismissed his army, and retired into Cumberland. Kenneth, his natural brother, regarding this conduct as dishonourable, prevailed on most of the soldiers to join his standard and continue the war. A battle soon afterwards ensued, in which both Constantine and Kenneth fell, each by the hand of the other, at the very moment when victory had declared for the latter.

In this critical emergency, the nobles elected Grimus, the son of Duffus, to the sovereign authority. This prince seems to have possessed greater popularity than his predecessor, for he was no sooner declared king than most of his opponent's partizans deserted to his cause. Malcolm's party therefore deemed it advisable to negotiate for peace, and accordingly a treaty was concluded, by which it was agreed that Grimus should retain the kingdom till his death, when it should revert to Malcolm and his heirs, according to the intentions of Kenneth. This peace was scrupulously observed during eight years; but after that period, Grimus having begun to evince a most tyrannical disposition, Malcolm thought himself justified in again taking up arms. He accordingly marched into Scotland, and as the tide of popularity was now decidedly in his favour, he soon acquired a

large army. Grimus marched to oppose him, but being betrayed by his soldiers, he was severely wounded in the first battle, and soon after terminated his existence.

Malcolm, on assuming the sceptre, laboured to compose the various factions which agitated the state, and to destroy the numerous banditti of robbers who had taken advantage of the laxity of the old government, to infest almost every district of the kingdom. He renewed, in his capacity of king of Scotland, the league which he had formed with the English, as governor of Cumberland, and in virtue of its conditions sent a corps of troops to assist them in opposing the Danes. This measure so roused the indignation of the Danish monarch, that he dispatched a large fleet and army to invade the Scottish territories, under the command of two of his best generals, Olave and Euceus. A landing was effected in the province of Moray, which being subdued, the invaders laid siege to the fortrefs of Nairn. Malcolm, who, during these operations, had been busily engaged in levying forces, arrived while the garrison yet continued a gallant defence; but being defeated, they were compelled to surrender; and the fortresses of Elgin and Moray were evacuated without resistance.

Upon these successes the Danes resolved to fix their habitation in Moray, and with this view sent home their ships to bring over their wives and children. In the mean time Malcolm re-organized his army, and made head against the enemy again at Mortlich, in the district of Marr. At first the Scots, discouraged by the fall of three of their commanders, retreated to their camp, where they made a vigorous stand, and changed their flight into a glorious victory. Malcolm, however, did not deem it prudent to advance far in pursuit, nor to attempt the expulsion of the whole Danish colony before he had recruited his forces with new levies. This cautious policy afforded time to king Swein to dispatch a second body of troops to the assistance of their countrymen. They were commanded by Camus, a general of tried courage and abilities, and disembarked near Aberbrothick, in Angus, whence they marched forward to the village of St. Bride, near which the Scots lay encamped, and ready to receive them. The action that followed terminated in the total rout of the Danes, who, finding their retreat to their ships cut off, dispersed in different directions. Camus and the most considerable party fled towards the mountains, with the intention of penetrating to Moray; but before they had proceeded far from the field of battle, they were overtaken, and either slain or made prisoners. A similar fate attended all the other fugitive bands.

This second discomfiture, though more signal than the first, did not yet discourage the Danish king. Immediately on being apprized of it, he sent a third armament under his own son, Canute, which landed in Buchan without opposition, and plundered the surrounding country. Malcolm, who had scarcely recovered the losses sustained in former battles, nevertheless hastened to oppose this new invasion. At first he declined risking a general engagement, but when he had ascertained that his opponents were less strong than was originally supposed, he seized a favourable opportunity to fall upon them with his whole forces. The battle was the most dreadful hitherto fought against the Danes; the Scots remained masters of the field, but were unable to pursue the enemy, who retreated without molestation. Next day, both parties, equally afraid to hazard another contest, eagerly listened to the interposition of the clergy, and concluded a peace, in which it was stipulated that all the Danes should leave Scotland, and that neither Swein nor Malcolm should, in future, wage war against one another.

Malcolm

SCOTLAND.

Malcolm having seen the first article of the above treaty performed, disbanded his army, and reigned for some years in greater splendour and glory than any preceding monarch of Scotland. As old age approached, however, he acquired an exorbitant love for money, a passion which led him to commit many acts of oppression and injustice. This conduct excited the hatred of the nobility, and eventually occasioned his assassination, though authors are not agreed as to the perpetrators of the bloody deed.

Duncan, the grandson of Malcolm, by his daughter Beatrix, succeeded to the vacant throne. He was a prince of great popularity, which he had justly acquired; but while his virtues endeared him to the wife and good, they awakened feelings of enmity in the breasts of the turbulent and seditious. Macdugald, a chieftain of the west, first raised the standard of rebellion, and attracted to it many of the islanders, and a body of Irish, who joined him in the hope of plunder. The king dispatched one Malcolm, a thane of high rank, to quell this insurrection, but he was unfortunately defeated and taken prisoner. Alarmed at that event, Malcolm summoned a council, in which Macbeth, one of his relatives, declared, that if he were made general of an expedition, in conjunction with Bancho, thane of Loch Abyn, they would soon bring the traitors to punishment. Macbeth obtained the wished-for command, and performed his task almost without resistance; for such was the terror infused into the rebels by his known character for severity, that on his approach they endeavoured to save themselves by flight, but the main body was overtaken, and most of them put to the sword.

Thus was Duncan freed from domestic sedition, but he did not long enjoy peace. The Norwegians, under Swein, king of Denmark, soon after landed in Fifeshire, and again aroused him from his natural inactivity. Having entrusted to Macbeth the charge of levying a new army, he himself advanced, with such troops as he could collect, to oppose the invaders, whom he met at Culrofs, where a battle ensued, which terminated to the disadvantage of the Scots. Duncan retired to the town of Perth, which was immediately besieged by the Danes. In the mean time Macbeth advanced with the new levies, upon whose arrival the king made a sudden attack upon the enemy's camp, while they were totally unprepared, and routed them with such slaughter, that only Swein, and a few attendants, were enabled to reach their ships.

But no sooner was Duncan relieved from this second danger, than he was alarmed by the news of the landing of the Danes in Fifeshire. Bancho marched to oppose their progress, and beat them back to their ships. About the same time, Macbeth, whose ambition led him to aspire to the throne, was encouraged in his daring views by a dream, in which he imagined that three women, naked, and of uncommon beauty, appeared to him and saluted him, one as thane of Angus, another as thane of Murray, and the third as king of Scotland. Henceforth he determined to accomplish his purpose at all hazards; and accordingly, having brought over many of the nobles to his side, he waylaid and murdered the king at Inverness. Macbeth then hastened to Scone, where he was invested with the royal authority. The sons of Duncan, astonished at these events, fled, one into Cumberland, and the other to the Hebrides. Shakspeare has dramatised some of these events in his admirable tragedy of "Macbeth."

The first act of Macbeth's reign was to suppress the feuds which subsisted between the thanes of Caithness, Ross, Sutherland, and Nairn. He afterwards defeated and slew Macgill, lord of Galloway, who refused to ac-

knowledge his authority; and quiet having been thus restored to the kingdom, he applied his attention to the enactment of many salutary laws, and to the correction of abuses in their administration. Thus he reigned ten years with so much justice, that the manner of his obtaining the throne was totally overlooked. At the close of that period, however, he began to give way to the natural cruelty of his temper, and to convert his hitherto laudable government into an oppressive and cruel tyranny. The first shock of his inhumanity was vented against Bancho, whom he invited to a feast, and caused to be slain on his return home, giving out that the deed was perpetrated in an accidental fray or tumult. Upon this, most of the nobles departed to their own castles, and only a few of them occasionally repaired to court. Hence mutual distrust and jealousy sprung up between them and the king, who upon the slightest pretences seized their property, and put them to death. The confiscated estates he employed to maintain a band of plunderers, whom he kept as a guard about his person. But even with their protection he did not consider himself in safety, and therefore resolved to erect a castle for his residence on the summit of Dunfinnan hill. In the accomplishment of this work, he ordered all the thanes of the kingdom to assist; but Macduff, thane of Fife, sent only workmen on his part: this disobedience exasperated Macbeth so much, that he swore vengeance against Macduff, who, fearful of the consequences, immediately fled to England, where he found Malcolm, the son of Duncan, royally treated by king Edward the Confessor. After several interviews with the Scottish prince, he encouraged him to assert his rights to the throne of Scotland. Malcolm, assured of Macduff's integrity, hesitated not a moment to adopt his views, and being assisted by king Edward with 10,000 men, he marched directly into Scotland, where he was joined by all ranks of the people. Macbeth, not daring to hazard a battle, endeavoured to escape, but was arrested and put to death.

Malcolm, having thus recovered his father's dominions, was declared king in the year 1057. This prince is said to have introduced into Scotland the titles of earl, baron, and knight. Macduff, to whose encouragement and exertions he owed the crown, is mentioned by Buchanan as having been the first who held the dignity of earl. At the same time, the privilege of placing the king in the chair of state at the ceremony of coronation was granted to him and his posterity.

But though Malcolm thus easily obtained the crown, he was not allowed to enjoy it long in peace. The faction of Macbeth proclaimed his son, Luthlac, king, and for three months contended openly for the maintenance of his pretensions. At length his followers were defeated and himself slain in Strathbogie. Malcolm now reigned for several years, undisturbed either by foreign or domestic enemies. In the interim Edgar Atheling, who with his mother and sisters had fled from England to avoid the suspicions of William the Conqueror, was driven by distress of weather into Scotland, where they were courteously received by Malcolm, who married Margaret, the sister of Edgar. The Scottish prince further protected all Edgar's banished friends, and assigned them lands for their maintenance. This conduct excited king William to declare war against Scotland; but after several unsuccessful attempts at invasion, he concluded a peace favourable both to Edgar and Malcolm.

The danger of foreign troubles being removed, several of the clans raised the standard of rebellion against the government, and for a time threatened its subversion; but the valour of Macduff, and of Walter, grandson of Bancho, eventually

SCOTLAND.

eventually restored quiet; for which service the latter was constituted lord steward of Scotland, and from him the royal family of Stewart were descended. Malcolm now applied himself to the reformation of the public morals, and established the two new bishoprics of Caithness and Moray. In 1079 he took advantage of the civil war in Normandy, between king William and his son, Robert, to devastate the county of Northumberland: to revenge this aggression, the English monarch sent an army into Scotland, but Malcolm's cautious policy prevented it from effecting any important exploit, and a treaty was soon afterwards negotiated between the two kingdoms. The accession of William Rufus, however, again proved the signal for hostilities. Malcolm advanced into England as far as Chester-in-the-Street, whence he retreated, as soon as he understood that the English army was in march to oppose him. William, in his turn, prepared for the invasion of Scotland both by land and sea, and had actually passed the borders, when the destruction of his fleet, and the intercession of Robert, duke of Normandy, and Edgar Atheling, induced him to conclude a peace with his antagonist. Malcolm promised the same homage which he had yielded to the conqueror; and William engaged to surrender to the Scottish king twelve manors, which Duncan had held in England, and to pay him twelve marks of gold annually: but peace did not continue long; William fortified Carlisle in the subsequent year, a measure which Malcolm pointedly resented: a personal interview was proposed in the hope of accommodating matters, but it had an opposite result. The Scottish king, therefore, led his army into Northumberland and besieged Alnwick; where he was surprised and slain, as was also his eldest son Edward, earl Mowbray, on the 13th of November, 1093.

Donaldbane, the brother of Malcolm, succeeded, but he was soon driven from the throne by his nephew, Duncan, who was assisted in recovering his dominions by king William Rufus; Duncan, however, had not enjoyed his dignity above six months, before he was assassinated at the instigation of his uncle, who once more usurped the crown, and reigned about two years, when he was a second time dethroned, and Edgar, the son of Malcolm, set up in his stead. This prince cultivated peace with king William Rufus, and his successor Henry I., to whom he gave his sister Matilda in marriage. Edgar died at Edinburgh on the 8th of January, 1106—7, and was succeeded by his brother Alexander I., who likewise preserved peace with his southern neighbours; but his reign was disturbed by an alarming rebellion at home, and by the ecclesiastical pretensions of the archbishops of York and Canterbury. His promptitude and valour, however, soon quelled the former, and his steady opposition to the latter enabled him to maintain the rights of his country and the independence of his government. Alexander died in April 1124, and was succeeded by David, the younger son of Malcolm and Margaret. This prince, having been educated at the court of Henry I., had acquired a knowledge of the English laws, and gained considerable experience in the art of government. Like his predecessor, he resisted with success the efforts of the court of Rome to destroy the independence of the Scottish church. His attention was afterwards drawn to an insurrection raised by Angus, earl of Moray, who was defeated and slain at Stracathrow, one of the passes of Forfarshire. During these transactions David maintained the strictest amity with England, till the civil dissensions which ensued upon the death of Henry, when he took up arms in support of the empress Matilda; but he afterwards concluded a treaty with the usurper, Stephen.

This lasted about two years, when David again passed the borders, and fought the battle of the "Standard" on the 22d of August, 1138. In that action the Scots were overthrown with great slaughter, and the king himself, with the remains of his army, found great difficulty in securing a retreat to Carlisle. David nevertheless soon recruited his troops, and shewed himself to be still formidable, by reducing the castle of Werk; but his further progress was arrested by the conclusion of peace. After this David applied himself chiefly to the laudable task of civilizing his yet semi-barbarous subjects. He founded several towns, and enacted the "*Leges Burgorum*," which still continue in force. He likewise introduced into the kingdom many Anglo-Saxon, Anglo-Norman, and Anglo-Belgic inhabitants, a measure that met with great opposition, but which nevertheless was eventually advantageous to Scotland. David died at Carlisle in May 1153, and was succeeded by the grandson of Malcolm, who had scarcely seated himself on the throne, before Somerled, a Hebridean chief, invaded the Mainland, and forced him to take the field. After various conflicts, Somerled was repulsed, but not subdued; and Malcolm was forced to conclude a peace with him, upon terms degrading to the dignity of the Scottish monarch.

About this time, the demise of Stephen placed the crown of England on the head of Henry II., who not only disregarded his solemn engagements to cede to Scotland the country lying between the Tyne and the Tweed, but demanded restitution of those territories which Malcolm held in England. The latter, conscious of his inability to wage war with so powerful a monarch, complied with this unjustifiable demand; and in return, Henry conferred on him the honour of Huntington, for which he did homage in 1157, reserving all his dignities. Malcolm on that occasion was invested with the honour of knighthood; after which he accompanied Henry to France. These circumstances excited great discontent among the barons, and Somerled took advantage of the distracted state of the country to renew his inroads. Malcolm, however, on his return triumphed over all his adversaries; but did not long enjoy his good fortune, having died at Jedburgh on the 9th of December, 1165.

William, the brother of Malcolm, now ascended the throne, and almost immediately repaired to the English court to demand the restoration of Northumberland. Henry amused him with fair promises for twelve months, when William began to perceive the futility of further solicitation; and therefore entered into a league with France, in 1168, though it does not appear that war was the immediate result. William, however, waited the borders in 1173; and in the subsequent year engaged in a similar expedition, during which he was surprised in his camp at Alnwick, and taken prisoner; an event which cost him the ancient independency of his crown: for, in order to gain his liberty, he stipulated to do homage to Henry for Scotland, and all his other possessions; engaged that all the barons and nobility of his kingdom should also do homage; that the bishops should take an oath of fealty; that both should swear to adhere to the king of England against their native prince, if the latter should break his engagements; and that the fortresses of Edinburgh, Stirling, Berwick, Roxburgh, and Jedburgh, should be delivered up to Henry till the performance of all these articles. "This severe and humiliating treaty," says Hume, "was executed in its full rigour. William, being released, brought up all his barons, prelates, and abbots, and they did homage to Henry in the cathedral of York, and acknowledged him and

SCOTLAND.

and his successors for their superior lord. The English monarch stretched still further the rigour of the conditions which he exacted. He engaged the king and states to make a perpetual cession of the fortresses of Berwick and Roxburgh, and to allow the castle of Edinburgh to remain in his possession for a limited time." This is the first great ascendant which England obtained over Scotland.

These disgraceful measures, and the feeble conduct of William, rendered him extremely unpopular. The lords of Galloway and Ross successively displayed the standard of rebellion, and though eventually compelled to submit, kept the kingdom in a state of disquietude for some years. In 1188, Henry II. sent Hugh, bishop of Durham, and several priests, into Scotland, to collect a *disne* for the Holy Land; but this met with the warmest opposition. He next offered to restore the castles of Roxburgh and Berwick to William, if he would give the tenths of the kingdom for the holy war; and his consent was only withheld, in consequence of the barons and clergy indignantly declaring, that "they would not pay, although both kings should have sworn to levy them." This was the last proposal of Henry affecting the independence of Scotland; as he died soon afterwards, leaving his crown to his son Richard, who restored to William all the rights and territories which had been wrested from him during the government of his father: thus Scotland again resumed her independence, though her monarch became the baronial vassal of England, as earl of Huntingdon. In the latter capacity William did homage to king John A.D. 1200, and after the ceremony demanded restitution of the three northern counties of England, a demand which was tacitly refused. In 1209, both monarchs assembled their troops on the borders, but the interference of their respective barons effected a reconciliation without bloodshed. From this period William lived in peace till his death, which occurred on the 4th of December, 1214.

Alexander II., the son of William, succeeded to the throne, and almost immediately engaged in hostilities against king John, in support of the barons. John lost no time in making a signal retaliation. In 1216 he passed the Tweed, and burnt the towns of Dunbar and Haddington. Alexander next year entered England to join Lewis, the French prince; but the death of John, and the subsequent disasters of Lewis, prevented the accomplishment of his designs, and a treaty was soon after concluded with Henry III. This pacification lasted till the year 1233, when the English king thought proper to call in question the validity of Alexander's coronation, and even intrigued to deprive him of his crown. In an interview between the two kings at Newcastle, they endeavoured in vain to accommodate their differences. They adjusted them nevertheless at York, in September, 1237; but as the terms of their agreement were unequal, it was not of long duration. Jealousies arose between them in 1244; Henry collected a large force at Newcastle, and Alexander marched to the frontiers a highly disciplined army, amounting, as some writers state, to the number of 100,000 men, all animated with the most determined resolution to defend their country. The appearance of so formidable a force induced the English barons to mediate a peace, which was accordingly agreed to. Alexander was next roused from repose by an insurrection in Galloway, which he had scarcely quelled, before Angus, lord of Argyle, assumed independence, and refused to acknowledge the sovereignty of the Scottish crown. The king marched against him, but died in Kerreray, an islet on the coast of Argyle, on the 8th of July, 1249. Chalmers remarks concerning this prince, that he is pro-

perly characterized by Fordun, "as a king, pious, just, and brave; as the shield of the church, the safeguard of the people, and the friend of the miserable."

Alexander III. was crowned at Scone July 13, 1249, after having been knighted by David de Berneham, bishop of St. Andrews. In 1251 he celebrated his nuptials with Margaret, daughter of Henry III., and on that occasion did homage for his English lands. The selfishness of Henry led him to demand homage for the kingdom of Scotland also, but the young king, with equal fortitude and prudence, replied, that he had come to England to be married, not to treat of affairs of state; and that he could not comply with his desire without the approbation of the great council of the Scottish nation. With this prince commenced that series of regal minorities which caused so much distraction to Scotland for several centuries, through the intrigues of the nobles, and of the court of England, to secure the chief influence in the state. Henry began to forward his views, by dismissing all the leading men attached to the late king, and elevating a more subservient faction to power; but this arrangement was quickly overthrown by a coalition of the nobles, headed by the Cumyns, who seized the persons of the king and queen, and ruled in their names. As this party consisted of the most powerful persons in the kingdom, Henry found it necessary to accommodate himself to the state of affairs, and a new regency was formed, including the chiefs of all the factions. Thus domestic peace was restored; but foreign invasion almost immediately succeeded. In the year 1263, Haco, king of Norway, came into the Clyde with a fleet of 160 sail, and landed a numerous army near Largs, in Ayrshire. The Scottish forces, commanded by Alexander, hastened to oppose him, and in a decisive battle fought on the second of October, in the same year, completely routed the Norwegians. Haco with difficulty escaped to his ships, attended only by a few followers, and soon after expired in Orkney. Magnus, his successor, made over to Alexander all the islands of the Hebrides in full sovereignty, but he still retained the islands of Orkney and Zetland. From this period the Scottish king was chiefly occupied, for several years, in asserting the independence of the Scottish church against the pretensions of the pope, and in curbing the ambition of his own clergy. In 1278 he went to London, to attend the coronation of king Edward I., and to do homage for the lands held by him in England. The events which ensued were at once afflictive to the king, and ultimately disastrous to the nation. Within one year, *viz.* in 1283, Alexander, the young prince of Scotland, and his sister Margaret, who had married Eric, king of Norway, died. The former had no issue, but the latter left an only daughter, Margaret, commonly called the Maid of Norway. The Scottish king, anticipating the dangers of a disputed succession, resolved, if possible, to avert them. He assembled the great council of the nation at Scone, in which it was declared that the princess of Norway should succeed to the throne, "failing any children Alexander might have, and failing the issue of the late prince," whose widow it was supposed might be pregnant. To add strength to these prudent measures, Alexander himself married, for his second wife, Joletta, daughter of the count de Dreux; but the festivities for that event had scarcely ceased, when he was killed by a fall from his horse, near Kinghorn, on the 16th of March 1285—6.

History of the Third Period.—On this fatal accident, Margaret was unanimously declared queen, and a regency, consisting of six principal prelates and barons, was appointed to govern the kingdom during her absence and minority. Through their exertions, and protected by her father Eric, and her grand

SCOTLAND.

uncle, king Edward of England, she seemed firmly seated on the throne; a circumstance from which the English monarch was led to anticipate great advantages. Having lately subjugated Wales, he formed the plan of marrying his eldest son, Edward, to the Scottish queen, hoping thereby to consolidate the whole island into one monarchy. With this view he drew closer the ties of amity between England and Norway, and did all in his power to attach the Scottish regency and nobles to his interest. The friendship which had of late prevailed between the two nations greatly facilitated the execution of this design, so favourable to the happiness and grandeur of both kingdoms. The states of Scotland not only gave a ready assent to the marriage, but agreed that their young sovereign should be educated in the court of Edward. Anxious, at the same time, to ensure the independence of their country, they took care to stipulate very equitable conditions before they entrusted themselves into the hands of so ambitious a monarch. It was solemnly agreed that they should enjoy all their ancient laws, liberties, and customs; that in case their queen should die without issue, the crown of Scotland should revert to the next heir, and should be inherited by him free and independent; that the military tenants of the crown should never be obliged to leave Scotland, in order to do homage to the sovereign of the united kingdoms, nor the chapters of cathedrals, collegiate or conventual churches, in order to make elections; that the parliaments summoned for Scottish affairs should always be held within the bounds of that kingdom; and that Edward should bind himself, under the penalty of 100,000 marks, payable to the pope, to observe all these articles. It is not easy to conceive that two nations could have treated upon terms of greater equality than Scotland and England maintained during the whole course of this transaction; and though Edward gave his assent to the article concerning the future independence of the Scottish crown, with a saving of his former rights, this reserve gave no alarm to the nobility of Scotland. The marriage treaty was therefore signed at Brighthelm, on the 18th of July 1296, with the cordial concurrence of all parties.

But this project, so happily planned, and so amicably conducted, failed of success by the sudden demise of the Norwegian prince, who expired in Orkney, while on her passage to Scotland, and left a very dismal prospect to the kingdom. Though for the present disorders were prevented by the authority of the regency, the succession of the crown was now become an object of dispute, and the regents could not expect that a controversy, which is not usually decided by reason and argument, would be peaceably settled by them, or even by the states of the kingdom, amidst so many powerful competitors. As the posterity of king William became extinct by the death of the Maid of Norway, the right to the throne devolved on the issue of David, earl of Huntingdon, brother of William, whose male line being also extinct, left the succession open to the posterity of his daughters.

The earl had three daughters, Margaret, married to Allen, lord of Galloway; Isabella, wife of Robert Bruce, lord of Annandale; and Adama, who espoused Henry, lord Hastings. Margaret, the eldest of the sisters, left one daughter, Devergilda, married to John Baliol, by whom she had a son of the same name, one of the present claimants. Isabella, the second, bore a son, Robert Bruce, who was now alive, and also urged his pretensions; Adama, the third, left a son, John Hastings, who contended that the kingdom of Scotland, like other inheritances, ought to be divided equally among the three daughters of the earl of Huntingdon, and that he had a right to a third of it, as representing his mother. Baliol

and Bruce united against Hastings in maintaining the indivisibility of the kingdom, but each of them supported by plausible arguments the preference of his own title. This occasioned a long and complicated investigation and dispute. Edward of England was appointed umpire, and he pronounced in favour of Baliol; but as he treated him in many respects as a vassal, imposing upon him the most degrading services, Baliol was soon incited to resist his pretensions, and the two kingdoms were thus involved in a war, which terminated in the conquest of Scotland. Edward, having settled the government, and, as he thought, ensured tranquillity, returned to the south, carrying with him the stone chair in which the Scottish kings were seated during the ceremony of coronation. Baliol was sent a prisoner to the Tower of London, where he remained two years, and was only liberated upon the condition of residing upon the continent during the remainder of his life. At this period William Wallace, one of the greatest heroes of which the annals of history can boast, appeared as the vindicator of his country's freedom. Beginning with small attempts, in which he was always successful, he gradually proceeded to more momentous enterprises, and discovered equal caution in securing his followers, and valour in annoying the enemy. His intimate knowledge of the country enabled him, when pursued, to ensure a retreat among the morasses, in the forests, or the mountains. At times he dispersed his associates in one place, and collecting them again in some distant quarter, surprised and routed the English before they had any idea of his approach. Every day was marked by some daring exploit, which increased his influence and means. At length he resolved to strike a decisive blow, by attacking Ormesby at Scone. The justiciary, apprized of his intentions, fled hastily into England, and was followed by all his colleagues in office, an event which gave a new character to the efforts of Wallace. Many of the principal barons, and particularly sir William Douglas, now openly countenanced his party, and the nation at large prepared to defend, by an united effort, that liberty, which they had so unexpectedly recovered.

In the mean time, the earl of Surrey having mustered an army of 40,000 men, hastened to suppress an insurrection, which had become formidable in a great measure from his own negligence. After traversing Annandale, he marched along the western coast to Irvine, where he found the Scots encamped, and sufficiently formidable by their numbers to have punished his temerity, if distrust and disunion had not weakened their ranks. Fortunately for him, however, the jealousies of the nobles were still stronger than their patriotism, and many of them auguring no advantage from resistance, submitted to the English, and received pardon. Others, who had not so unequivocally declared themselves, likewise joined the oppressors of their country. Wallace alone remained inexorable to bribe or threat; but thus deserted, he was unable to give battle to the governor, and therefore marched to the northward, with the intention of prolonging the war, and of turning to his advantage the mountainous districts of the Highlands. When Warrene arrived at Stirling, the Scottish hero lay encamped at Cambuskenneth, on the opposite side of the Forth; the English commander again endeavoured to negotiate, but Wallace replied, that his object was not to treat, but to set Scotland free. This bold language being construed by the English as a defiance, they demanded to be led against the enemy. Warrene hesitated, but Cressingham urged an immediate attack, and his counsels prevailed. The English began to pass the bridge that separated the two armies, but before half of them had reached the opposite side, they were attacked

SCOTLAND.

tacked by Wallace, and either pushed into the river, or destroyed by the sword. Among the slain was Cressingham himself, whose memory was so hateful to the Scots, that they flayed his dead body, and made girths of his skin. The remainder of the English army precipitately retreated into England. Wallace pursued, and reduced the fortresses of Berwick and Roxburgh; Dundee and the other strong holds also capitulated, and thus was Scotland a second time freed by the valour and constancy of her patriotic champion.

Wallace was now declared guardian of the kingdom by the unanimous voice of his followers, and with the general consent of the people, and under this title he directed affairs in the name of the captive Baliol. As the misfortunes of war and an unfavourable season had produced a famine, he marched into England, laid waste the northern counties, and returned loaded with spoils, and crowned with glory.

Edward, who during these transactions was prosecuting the war in Flanders, having concluded a truce with France, hastened over to England, in the confident hope of recovering, by his activity and vigour, the important conquest of Scotland, which he always regarded as the chief advantage of his reign. For this purpose he assembled an immense army, with which he laid siege to the castle of Dirlتون. Wallace in the mean time, sensible of the jealousy of the Scottish nobles, voluntarily resigned his authority as guardian to the Stewart of Scotland, and Cumyn of Badenoch, men of eminent birth, under whom he hoped the great chieftains would be more willing to fight in the defence of their country. These two commanders took post at Falkirk, and determined there to await the assault of the English. Wallace also brought his troops hither, and placed them at the disposal of the regents. The resolution of the Scottish chiefs to risk a general battle was highly agreeable to Edward, whose army was already much straitened for provisions, and was in a state of mutiny. He advanced therefore with great rapidity to Falkirk, and immediately on his arrival led his troops to the attack. Cumyn, with his division, fled on the first onset, and left that of the Stewart to be cut to pieces. This cowardly conduct decided the fate of the day; but in the general route, Wallace's military skill enabled him to preserve his patriot bands entire. After a gallant resistance he retreated leisurely along the banks of the Carron, followed by a corps of the English army under the orders of Bruce, who demanded a conference with the Scottish hero, in which the latter fully convinced him of his want of patriotism, in espousing the cause of the oppressor of his country.

Soon after this victory, Edward returned to England, and the Scots once more rallied, and obtained many advantages over the forces left behind by the English monarch. Three victories were gained in one day, and the renown of these great exploits, seconded by the favourable disposition of the people, soon made the regent master of all the fortresses in the south, and it became necessary for Edward to begin anew the conquest of the kingdom.

The English king accordingly prepared for that event with his usual activity and prudence. He assembled both a great fleet and army, and entering the kingdom, proceeded almost to its furthest extremities, without encountering any opposition. All the nobles, and even the regent himself, made their submissions to the conqueror. The only fortresses which did not immediately yield were those of Brechin and Stirling. So gallantly, indeed, did the garrison of the latter defend their trust, that it was nearly demolished before Edward, after a siege of four months, was enabled to take it by assault, an event which again placed the whole of Scotland under his power. Still, however, he distrusted

the permanency of his success, for Wallace was yet alive, unfulfilled in his character, and unbowed in his spirit. Edward employed every art to discover his retreat, and to obtain possession of his person; and he at length succeeded, through the treachery of sir John Monteith, whom Wallace had always regarded as one of his bosom friends. By him he was arrested, and sent in fetters to London, where he was tried as a traitor, though he had never made submissions or sworn fealty to England, and was executed on Tower-hill, on the 23d of August, 1305. Such was the unworthy fate of the greatest hero and most disinterested patriot of his own or perhaps of any other age.

By this unjust and barbarous treatment of the gallant Wallace, Edward hoped to strike terror into the Scots, and ensure their submission. These calculations, however, were soon shewn to be erroneous. The execution of Wallace, and the exposure of his mangled limbs in different towns of the kingdom, served only to inflame the resentment of his countrymen. Even the nobles, whose jealousy of his influence had prevented his final success against the tyranny which oppressed them, bewailed his fate, and vowed vengeance against his murderer. Bruce, in particular, became more confirmed in his purpose of asserting his rights, and vindicating the liberties of his country. Flying to different parts of the kingdom, he incited the people to rise against their oppressors, attacked and defeated the detached parties of the English, secured the possession of many fortresses, and having established his authority in most places of the south, proceeded to Scone, where he was solemnly crowned on the 27th of March 1306.

Bruce having by repeated successes driven all the English from Scotland, except such as fled to the few fortresses still in their hands, Edward dispatched Aylmer de Valence to crush this new and formidable revolt. That nobleman advanced without opposition to Methuen, in Perthshire, where he found the Scottish forces encamped, attacked them before they were aware of his approach, and gained a complete victory. The Scottish king fought with great courage, but was at last obliged to quit the field, and to seek security for himself and a few followers in the Western islands. All the prisoners of note were executed as rebels, and many acts of outrageous oppression were exercised against those of inferior rank. On the death of Edward, which happened in 1308, Bruce resolved again to try the fortune of war. He attacked and brought under his dominion the territories of Argyle, and thereafter took the fortresses of Inverness, Forfar, and Brechin. By these exploits he gradually increased his influence, and reconciled the barons to his cause. Indeed, such was the alacrity with which the people in general seconded his operations, that in three months the whole of Scotland, except one or two fortified places, were wrested from the tyranny of the English. Edward, harassed by dissensions at home, now found it necessary to agree to a truce, which, though it was only of short duration, enabled Bruce to consolidate his power, and organize his government. At its conclusion he entered England, and gratified the revenge and cupidity of his followers by laying waste and plundering the northern counties. Edward, in his turn, became the assailant during the same year, and advanced beyond Edinburgh. But the want of provisions soon obliged him to retire, without having gained any material advantage. But though he abandoned Scotland for the present, he resolved to undertake its conquest again at no distant period. With this view he summoned the most warlike of his vassals from Gascony, enlisted numerous foreign troops into his service, and assembling the whole military force of England, marched towards the borders with an army composed of

SCOTLAND.

100,000 men. The Scots at this time were besieging the castle of Stirling, and had compelled the governor to a capitulation, unless relieved by a certain day. Bruce, judging that Edward would endeavour to save this fortress, posted his army at Bannockburn, about two miles to the southward, where his right flank was protected by a precipitous hill, and his left by a deep morass. This gallant band consisted only of 30,000 combatants, but all of them men of tried courage, determined to perish or to ensure the liberties of their country. The English arrived in sight on the 24th of June, and on the same evening dispatched a body of horse to penetrate to the castle. Bruce ordered his nephew, Randolph, earl of Murray, to intercept their march, and a furious engagement ensued, which terminated in the total discomfiture of the invaders, and contributed greatly to the confidence of the Scots. Early on the following day the English king led his army to a general attack. The earl of Gloucester, who commanded the cavalry, rushed forward to the charge with the utmost impetuosity, and fell into the covered pits which Bruce had formed in front of his line. The Scottish cavalry, commanded by sir James Douglas, advanced upon them, and after a prodigious slaughter, chased them from the field. Returning, they threw themselves upon the rear of the infantry, who were engaged by the Scottish foot. At this critical moment, the waggoners and sumpter boys of the army, whom Bruce had supplied with military standards, appeared on the summit of a neighbouring hill, and decided the fortune of the day. The English, supposing them to be another army, were panic struck, threw down their arms, and fled in the utmost confusion. They were pursued by the victors as far as Berwick with immense loss; and the king himself escaped only by the fleetness of his horse. The Scots, besides an inestimable booty, took many persons of quality prisoners, and above 400 gentlemen, all of whom Robert treated with great humanity. Barton, a monk of Scarborough, who had accompanied Edward to celebrate his triumph, composed a poem in honour of the victory of the Scots, as the price of his liberty; and the ransom of the other prisoners brought a great accession of wealth to the victorious army. Such, says an eminent historian, "was the great and decisive battle of Bannockburn, which secured the independence of Scotland, fixed Bruce on the throne of that kingdom, and may be deemed the greatest overthrow that the English nation, since the conquest, has ever received. The number of slain on those occasions is always uncertain, and is commonly much magnified by the victors. But this defeat made a deep impression on the minds of the English, and it was remarked, that for some years no superiority of numbers could induce them to keep the field against the Scots."

After this victory the castle of Stirling surrendered according to agreement, and that of Berwick was taken by assault. Bruce likewise attempted to make himself master of the town of Carlisle, but his efforts were baffled by the bravery of its garrison. In April 1315, he assembled a parliament at Ayr, to settle the succession to the crown, which was declared to devolve to sir Edward Bruce, his brother, in preference to the king's own daughter Margery, who gave up her rights for the benefit of her country. Sir Edward immediately passed over into Ireland, to aid the Irish against the English, and he was soon after followed by the king himself, but the latter returned to Scotland in the same year. His brother, however, continued to pursue his projects of conquest, till his defeat and death in the battle at Dundalk, which was fought in 1318. This event rendered a new settlement of the regal succession necessary, and accordingly a parliament met at Scone in December, and ac-

knowledgeed as heir, Robert, the infant son of Margery, who had married the Stewart, and died in 1316. But this destination of the crown was also rendered nugatory in the first instance, by the birth of a son to the king himself, in 1323. In the mean time the war continued to rage with various success, and Robert dispatched Randolph as ambassador to France, to conclude a treaty offensive and defensive with Charles IV. In March 1327, the English government agreed to acknowledge the kingship of Bruce and the independence of Scotland, and passed a solemn act of parliament to that effect. The treaty of Northampton was the immediate consequence, and settled the peace between the contending kingdoms as independent sovereignties. One of its stipulations was, that David, the infant son of Robert, should marry Jane, the sister of the English king. Bruce, having thus obtained the consummation of his magnanimous efforts, died in the year following, at the age of fifty-five.

David I. now ascended the throne, which the abilities and vigour of his father had re-established, apparently on a firm foundation. Randolph, earl of Murray, was declared guardian to the young king; but, unfortunately for the prince and for Scotland, he died in 1332, the very year in which a new competitor for the crown arose in the person of Edward Baliol, son of that John who had so meanly surrendered his kingdom to Edward I. This pretender, with the secret support of the English monarch, collected a considerable body of troops, and landed in Fifeshire. The new regent, Donald, earl of Mar, hastened to oppose this invasion, and for that purpose is said to have mustered an army of 40,000 men. His imprudence and want of skill, however, destroyed the advantages which superiority of numbers gave him over his antagonist. Both armies encamped opposite to each other, separated only by the river Erne; and the regent, confiding in that security, and the small force of the enemy, neglected all order and precaution. Baliol, apprized of this, passed the river in the night, penetrated into the camp of the Scots, threw them into confusion, and pursued them from the field with great slaughter. Baliol, on this unexpected success, marched for Perth, and made himself master of that important station. Here he was besieged by the earl of March and sir Archibald Douglas, but their efforts were defeated, and Baliol was proclaimed king. David and his betrothed queen were sent over to France, and the leaders of his party fled for and obtained a truce from his competitor, whose power they were unable to resist. Thus did Baliol, by a display of the most chivalrous valour, seat himself on the throne of Scotland. His reign, however, was of short duration, for having dismissed the greater part of his English followers, he was attacked and defeated near Annan, by sir Archibald Douglas, and other chieftains of the Bruce faction. By this disaster Baliol lost his kingdom more rapidly than he had gained it. But in the interval he had induced the English king openly to support his cause, by offering to acknowledge his superiority, to renew the homage for his crown, and to espouse the princess Jane, whose marriage with David was not yet consummated. Edward had eagerly embraced these offers; and as the dethronement of Baliol now rendered them ineffective, he resolved to reinstate him in the possession of the crown, an enterprize which he flattered himself would be easy. Accordingly, he besieged Berwick, which the governor, after a gallant defence, agreed to surrender, unless relieved by a certain day. The regent being informed of this capitulation, was forced, contrary to his wishes, to risk the fate of the kingdom on the issue of one battle. He attacked the English at Halydon Hill, north of Berwick, and as he himself was slain at the first onset, his army was totally routed. The English
writers

SCOTLAND.

writers calculate the loss of the Scots in this action at 30,000 men; while Edward is said to have lost only one knight, one esquire, and thirteen private foldiers; an inequality, as Hume properly remarks, almost incredible.

By this victory Baliol again obtained the sovereignty, and was formally acknowledged king in a parliament assembled at Edinburgh. The terms on which he acquired that dignity, however, were too degrading for the Scottish nation to submit to long; as he not only swore fealty to Edward, but actually ceded to him, in perpetual possession, all the south-eastern counties of the kingdom. No sooner, therefore, were the English troops withdrawn, than the Scots, a second time, effected the expulsion of Baliol. Edward marched again into Scotland, and the patriots prudently retired to their hills and fastnesses, whence they issued immediately on his retreat, and reconquered their country. A third time the English monarch became the invader, and with similar success; for every new attempt to impose the discarded monarch upon the nation only served to inflame the general indignation against him.

The English king about this time was led to advance pretensions to the throne of France, which soon embroiled him in a war with that kingdom. This event elated the hopes of the Scots, who gradually reduced all the fortified places held by the English within their territories; and in order that they might have the countenance of sovereign authority, they invited David and his queen to return to Scotland. The royal pair accordingly landed at Innerberry, in the Mearns, in June 1342. Indignant at the desecration that every where met his eyes, David immediately entered England, and ravaged the country as far as Newcastle, to which he laid siege; but after several disastrous assaults, he was obliged to abandon the enterprise. David again invaded England in 1347, and advanced to the vicinity of Durham, where he was encountered by an English force, raised by the energetic conduct of queen Philippa. The contest was warmly maintained for some time on both sides, but the Scots were in the end defeated, and the king himself, and many of the nobility, made prisoners. Baliol, who commanded the English army in this action, prosecuted his victory with great vigour. Before the conclusion of the year he had reduced the castles of Hermitage and Roxburgh, and extended his conquests over Annandale, Teviotdale, and Tweeddale. In the next year success continued to attend his march; but in 1348 he was forced to retreat into England, and a truce was agreed to. On its expiration, in 1355, the Bruces once more took the field, which they were better enabled to do by means of a considerable assistance, both in men and money, furnished to them by the French king. One party, commanded by lord Douglas, completely defeated the English marchers at Nisbet Moor, and afterwards assaulted and took the town of Berwick, but the approach of Edward prevented the reduction of the castle. At this period Baliol, tired of attempting to regain a crown, determined to retire into private life, and to resign to the English king all his rights to the throne, in exchange for a subsistence adequate to his rank. The bargain was agreed to, and Edward marched into Scotland with a powerful army, to secure his newly acquired possessions. The Scots adopted the wise policy of harassing their enemy by frequent skirmishes, in which they were so successful, that Edward was soon compelled to a precipitate retreat. During these events David remained a prisoner in England, but in May 1357, a truce was concluded, wherein he was virtually acknowledged king, and was ransomed for the sum of 100,000 marks, to be paid by instalments within ten years.

David having, by this treaty, regained his liberty, paid

the two first instalments of his ransom; but he found it impracticable to raise money for the third payment. After various unsuccessful expedients, therefore, he was obliged to appeal to Edward himself, and to conclude a treaty with him in 1363, in which it was stipulated that the latter should succeed to the throne of Scotland, and that a federal union of that kingdom with England should take place, provided David died without issue. But the Scottish nobles having rendered this treaty ingratulatory and unavailing, another was agreed to in May 1365, by which Scotland became bound to pay to England the sum of 100,000 pounds within the space of 25 years. From this period no event occurred worthy of notice in the history of Scotland, till the death of David, which happened in Feb. 22, 1370—71; when Robert II. succeeded to the throne, and was crowned at Scone on the 26th of March 1371, at the advanced age of 55. Among the first acts of his government, was the dispatch of ambassadors to France, by whom was negotiated a treaty, which stipulated that neither the king of Scotland nor the king of France should be obliged to make war upon England; that not even the dispensation of the pope should relieve either party from their engagement to each other; that, in the event of a competition for the crown of Scotland, the king of France should take care that no English influence was used; that he should acknowledge the king elected conformably to the laws; and that no Frenchman should serve against Scotland, nor any Scotchman against France.

Robert and Edward continued to keep up a friendly correspondence, notwithstanding their respective borderers were engaged in perpetual hostility, and the former was punctual in discharging the instalments of his uncle's ransom.

Robert, who had a numerous progeny, and seems to have feared some disputes might arise relative to the succession after his death, convoked a parliament at Scone, in April 1373, in order that their declaration might guard the kingdom from a repetition of its past misfortunes. This parliament recognized, in the first instance, the title of John, earl of Carrick, and the Stewart of Scotland, his eldest son by Elizabeth More, his first wife, thereafter his other sons by the same lady, according to their seniority; his sons by Euphemia Ross, his second wife; and lastly, "the true and lawful heirs of the blood and stock royal." Buchanan erroneously calls Euphemia Ross the first wife, and Elizabeth the second wife, alleging that the children of the latter were born during an illegitimate connection in early life; but sufficient evidence has been adduced from papal archives to shew that the king married Elizabeth More at a date prior to his marriage with queen Euphemia, and that she died long before he ascended the throne.

In 1377 the border was again to rage with signal fury. The lord Percy, now earl of Northumberland, ravaged the estates of the earl of March, and a party of Scots, commanded by one Ramsay, surprised the castle of Berwick, and declared that they held it for the king of France. It was re-taken, however, by assault, after a siege of nine days, when all the garrison, except Ramsay, were put to the sword. The English army then marched into Scotland, but their advanced guard having been entirely cut off, they desisted from their expedition. In 1379, the Scottish borderers again invaded England, and laid waste the country. The earl of Northumberland, in retaliation, fitted out privateers, and captured some Scotch ships; but the English government resented these proceedings, and ordered the border earls not to provoke the Scots, but to observe the truce. These commands, however, not being attended to, the earl of Douglas burst into Cumberland with 20,000 men,

SCOTLAND.

men, plundered the town of Penrith during its fair, and returned with an immense booty in merchandize, besides 40,000 head of cattle.

The duke of Lancaster, about this time, was sent to repress the borderers, and also to obtain some satisfaction from the Scottish king for the many infractions of the existing truce, which had been committed by his subjects. Before he entered upon hostilities, however, he invited the Scots to a treaty, and a truce was agreed to for ten months, which was afterwards prolonged for seven months more. But this convention seems to have related only to the borders, as the Scottish monarch does not appear as a party to it. This pacific conduct of the duke created him many enemies in England. Hence, when the people rebelled against his nephew's government, he found it necessary to seek safety for a short time in Scotland, where he was hospitably received. On his return, the Scots having assaulted the castle of Werk, he was again dispatched to demand reparation, and to treat of a general peace. Conferences were accordingly held with the earl of Carrick, but nothing definite was agreed to. Indeed the continuance of peace appears not to have been the wish of the Scottish monarch, for he soon after renewed the ancient league with France, and commenced hostilities by taking the castle of Lochmaben. On this the duke advanced as far as Edinburgh, whence he was obliged to return to Berwick, without having gained any advantage. The Scots again became the aggressors, and had laid waste the country as far as Newcastle, when the conclusion of a new truce put an end, for a time, to regular hostilities. The border wars, however, still raged, and the town of Berwick was taken by the Scots, but was given up again on payment of 2000 marks.

On the expiration of the truce, Robert, who had received considerable supplies from France, prepared to invade England, and create a diversion in the north, while a French army should land in the south. But in the interim the French king was obliged to abandon the intended descent upon England, and hence Robert was left to contend, single-handed, against the undivided force of that powerful monarchy. Richard marched into Scotland at the head of 60,000 men. The Scottish king wisely refused to risk a general action, though strongly urged to do so by the officer commanding the French auxiliaries, contenting himself by harassing the enemy by frequent attacks, till they were forced to retreat within their own territories. After this, the earl of Douglas invaded Ireland and the Isle of Man, whence he returned with immense booty. Robert, elated by these successes, resolved to attempt an invasion of England on a grand scale. Accordingly a powerful army entered Northumberland, and laid siege to Newcastle, which was defended by Henry Percy, furnished Hotspur. This nobleman challenged Douglas, the Scottish general, to meet him in single combat, and the challenge having been accepted, a contest took place in fight of both armies, and terminated in the overthrow of Hotspur. Next day Douglas ordered a general assault, but was unsuccessful; and as the English had received reinforcements during the night, he deemed it prudent to retire towards Scotland. Percy, eager to wipe off the disgrace of his personal defeat, pursued, and came up with the Scots at Otterburn, where a battle was fought by the light of the moon, and is represented by historians as the most obstinately contested of any that occurred in that age. Earl Percy, and above a hundred persons of distinction, were made prisoners, and contributed, by their ransoms, to enrich their conquerors. Scarcely was this battle finished, when another English army appeared in view, under the orders of the bishop of Durham. The Scots, notwithstanding their fatigued state, resolved to

venture a second contest, and nobly disdaining the customary barbarity of putting their prisoners to death, (though nearly as numerous as their whole army,) drew up in martial array, having simply required them to give their word of honour that they would not interfere in the action. The bishop, who imagined the Scots would fly at his approach, perceiving their bold attitude, thought it more advisable to retreat than to hazard the destruction of his army. The Scots henceforth continued their march unmolested; and, in testimony of the honourable conduct of their prisoners, they dismissed all those of inferior rank without ransom, and accepted obligations from their superiors, all of which were punctually fulfilled; examples of honour and generosity worthy of the most enlightened period of society.

In the year 1389 a treaty was concluded between the kings of England and France, to which the Scots were invited to accede; but as the earl of March and the lord of the Isles were admitted as parties, great opposition was manifested to it by the nobles, who considered both these noblemen as subjects of the Scottish monarchy, and therefore not entitled to treat as independent persons. The king, however, inclined to peace, and after some explanations on the part of the French and English ambassadors, the nobles were induced to give a reluctant consent to the termination of hostilities for three years. Robert died soon afterwards, oppressed with grief and age, April 19th, 1390, and was succeeded by his eldest son, John, earl of Carrick, who assumed the title of Robert III. In earlier life he had commanded armies, and negotiated treaties, with ability and success, but he had lived for some time in retirement. Now that he was called to the throne, he committed the direction of public affairs to his brother, the earl of Fife, by whose advice he confirmed the late truce, and renewed the ancient league with France. In this reign a violent feud broke out between the clans Chattan and Kay, which raged for nearly three years with the most ruthless fury. The earl of Crawford was sent to restore peace; but fearing that the employment of force might cause an union against the government, he had recourse to the following expedient, which serves to illustrate the character of the Highlanders, and the general state of society in that age. He proposed that their quarrel should be decided by thirty champions from each clan, who should fight with the sword only, in presence of the king and his court. The proposal, being perfectly agreeable to the spirit of the feudal laws, was sanctioned by both parties. A level spot near Perth was fixed upon for the scene of action, but when the combatants were mustered, it was found that one of them, belonging to clan Chattan, had failed to appear. In this difficulty it was suggested that one of clan Kay should be withdrawn, but all of them refused to relinquish the honour and danger of the combat. Various other expedients were started with no better success. At length Henry Wynd, a smith, no ways connected with either clan, offered to supply the place of the absentee, and his offer was accepted. The champions on both sides now joined battle, and after a contest probably unparalleled for its fury, victory declared for clan Chattan, principally owing to the superior heroism of Wynd, who, with ten of his comrades, all desperately wounded, alone survived the contest. Of clan Kay one only was left alive, who, being unhurt, threw himself into the Tay and escaped. This singular combat happened in the year 1396; and in 1398, as the truce with England had nearly expired, it was prolonged, and several regulations were made tending to preserve the peace of the borders. In the same year the title of duke was first introduced into Scotland, by the elevation of the king's eldest son David to the dukedom of Rothsay; and of his own brother,

SCOTLAND.

brother, the earl of Fife, to the dukedom of Albany. A custom also began to prevail in the border treaties, of naming cautioners, who acted as conservators of the peace, and were a kind of attorneys for their fellow subjects, in all matters cognizable in the border courts, which had been lately established on both sides. These regulations are justly considered as important steps in the progressive civilization of the two kingdoms.

The events of the year 1401 were the most disastrous in themselves, and in their consequences, which ever occurred to Scotland. The death of earl Douglas was followed by those of William Trail, archbishop of St. Andrews, a prelate of great weight; and queen Annabella, a woman of exemplary virtue and prudence. This princess, by her influence, had conciliated the jealousies of several branches of the royal family, and in particular had restrained the impetuous temper of the duke of Rothsay, the heir apparent to the throne, who was barbarously murdered soon after by the duke of Albany. The truce with England being now expired, war was renewed on the borders, and a severe action was fought at Western-Nisbet, in which the Scots were defeated. So strongly contested was this battle, that it is affirmed that few of either army escaped unhurt. It was succeeded in the year following by another combat, fought between the troops of Henry Hotspur and Douglas, at Homeldon, where the English were again victorious, and numbered among their prisoners the earls of Douglas, Fife, Angus, Murray, lords Montgomery, Erskine, Graham, and Orkney, eighty knights, and about 10,000 gentlemen and private soldiers. This battle, so immediately disastrous to Scotland, proved in its results no less so to England. King Henry having ordered earl Percy and the other barons not to ransom their prisoners, they regarded that mandate as such a tyrannical infringement of their feudal rights, that they raised the standard of revolt against the government, and for a time defied all its efforts. The victory of Shrewsbury, and the fall of Percy, terminated this formidable insurrection. Douglas, the rival of Percy, was present in this battle, and was taken prisoner, but his conduct had so greatly excited the admiration of the English king, that he gave him his liberty without ransom.

Henry, notwithstanding this victory, was extremely desirous of concluding a peace with Scotland, in order that he might employ the whole force of his government in overawing his discontented subjects. He first attempted to open a negotiation through the medium of the French ambassadors at the Scottish court, but finding that measure unavailing, he dispatched special commissioners with the same view. The result was unfavourable, and hostilities continued, though without any remarkable transaction on either side. All this time Robert remained ignorant of the fate of the duke of Rothsay, but it soon became necessary to make him acquainted with it. The king, unable to punish his murderers, adopted the prudent resolution of sending his second son James to France; he did not reach his destination, having been captured by an English privateer, and sent as a prisoner to London. The news of this second disaster so affected Robert, that he died three days afterwards, in March 1405.

On this event the states of the kingdom nominated the duke of Albany regent. This prince was a man of consummate abilities, but ambitious, and hence appears to have been lukewarm in his endeavours to obtain the liberty of his sovereign. The spirit of the people, however, forced him to declare war against England, but it was soon terminated by a truce, during which it was proposed to enter into negotiations for a permanent peace. Conferences were, in

consequence, held for that purpose, but they ended only in a prolongation of the truce, at the close of which the war was renewed, and Henry prepared to strike a decisive blow against Scotland; but these preparations were never carried into effect, as a treaty was agreed to which lasted till 1415. This period of Scottish history is distinguished by the foundation of the university of St. Andrew's, the first institution of the kind of which Scotland can boast. (See *St. ANDREWS*.) It may therefore be regarded as an era of peculiar interest, as from it may be dated the rise of learning in that kingdom; which, though confessedly among the last to devote itself to science, has contributed as much to its progress as any other nation of modern Europe.

The truce last-mentioned being ended, the Scots besieged Berwick, but that enterprise was unsuccessful, and all that was done during the campaign was the burning of Penrith by the Scots, and of Dumfries by the English. Next year negotiations were entered into for the liberation of James, but these were as fruitless as the former, and the war continued. No action worthy of record, however, occurred during five years, and hence it has been, with some probability, surmised that there existed an understanding between the regent and the English general; though this would not seem to have been the opinion of his contemporaries, for we are told that, on his death, which happened in 1420, the Scots held his memory in such veneration that they conferred the regency on his son Murdoch, solely from respect for the father.

In 1421, king Henry being informed that the earl of Douglas was meditating an invasion of the northern counties, invited him to a conference at York, when the earl, with the consent of James, agreed to serve the English king during life. At the same time some stipulations were made relative to the release of the Scottish monarch, but that event did not take place till the year 1424. Henry V. was then dead, and the tide of fortune in France had so completely changed, that the English regent found it necessary to conciliate the Scots, and if possible to detach them from the French interest. He therefore treated James with the greatest attention, and proposed a negotiation for his liberty. Commissioners were, in consequence, named on both sides, who agreed that the Scottish king should be ransomed for 40,000 pounds, and should marry some lady of the first quality in England. James, it is probable, had already fixed his choice upon the lady Joan, daughter to the late earl of Somerset, son to John of Gaunt, duke of Lancaster, by his second marriage; but he made his people the compliment, not only of consulting their opinion, but of concluding the match. The royal nuptials were celebrated in the beginning of February 1424, when the young king of England presented James with a suit of cloth of gold for the ceremony, and the next day gave him a legal discharge for 10,000 pounds, to be deducted from the amount of his ransom, as the marriage portion of the lady.

Hitherto the history of Scotland consists of little else but a detail of battles and predatory excursions; of feuds between lawless clans, and rebellions against the sovereign authority. Neither the government nor the people were sufficiently enlightened to recognise fixed principles of foreign or domestic policy. The great barons, though bound to render homage to the king, and to perform several feudal services, assumed all the importance, and exercised most of the functions, of independent princes. On the accession of James I., however, to actual power, the annals of the kingdom begin to assume a new aspect. The reiterated theme of defeats and victories, of negotiations and truces, may henceforth be diversified with more interesting intelligence, and

SCOTLAND.

and the arts of peace may afford a pleasing contrast to the devastations of war.

James, shortly after his arrival in Scotland, was solemnly crowned, with his queen, and Murdach, duke of Albany, as earl of Fife, performed the ceremony of placing his sovereign on the throne. His first public act was to convene a parliament, and to direct their deliberations to the enactment of salutary laws. Among other enactments it was declared, that the ancient privileges of the church be confirmed; that the king's peace be firmly held, and no private wars allowed; that no man should travel with more followers than he could maintain; that efficient administrators of the law be appointed through the realm; that no extortions, from churchmen or farmers in particular, be admitted; that the customs and borough rates be assigned to the king, also mines of gold and silver, under certain restrictions; that the clergy should not pass the sea without the king's permission, nor have pensions out of benefices in Scotland; that gold and silver should not be exported, but upon paying a high custom; that all persons under twelve years of age should be taught archery; that agriculture be protected; that certain customs be raised on horses, cattle, sheep, herrings and firs; that inns be kept in every borough; and that no beggars be allowed, except permitted by the sheriff in the county, and in towns by the alderman or bailie. Two other enactments were made by the same parliament, which merit separate consideration: the first granted to the king a large subsidy, by taxation, for defraying his ransom, which occasioned so much dissatisfaction, that he was obliged to avert the danger of a general insurrection, by giving up the idea of levying the imposed taxes. Unaccustomed to pay direct contributions toward the support of the government, the people considered this ordinance as an act of oppression, and were blind to the advantages which might have resulted from its completion. The second enactment ordered all sheriffs to inquire what lands had belonged to the crown under the three preceding monarchs, and authorized the king to summon the holders to shew their charters. The object of this decree was to recover the royal demesnes, which had been parcelled out by the duke of Albany among his friends. Determined to punish that prince for his mal-administration, he arrested him, his two sons, and the earl of Lennox, his father-in-law, and took possession of their estates and castles. They were afterwards brought to trial, and a verdict having been found against them, they suffered death at Stirling. This part of James's conduct is defended by some authors as just and politic, while others represent it as cruel and tyrannical. The whole reign of James passed in peace with England till within a month of his death, and it is certainly much to his honour, that he employed himself in promoting civilization, and establishing regular government among his subjects, rather than in wasting their lives and property in the pursuit of war. He nevertheless cultivated a close alliance with France, and entered into a treaty with that kingdom, by which it was agreed, that the dauphin should espouse the young prince of Scotland. Numerous statutes were passed during this period for the encouragement of trade and agriculture, and for regulating the proceedings in the administration of the law. All these measures were taken with the approbation of the States, and seem to have been approved by the nation at large. The seizure of the royal estates, however, had created James many virulent enemies, and at length proved the cause of his murder. He had further awakened the jealousy of his nobles by some attempts to curb their exorbitant powers; and they appear to have dreaded lest he should make still bolder and more decisive encroachments on their feudal rights. Such were the sentiments and

feelings of parties when sir Robert Graham called a meeting of the chief men to represent their grievances to the king. A remonstrance was accordingly resolved upon, and Graham was appointed to deliver it to James in the next parliament; but the violence of his conduct destroyed all the benefit which might otherwise have resulted to their cause from this step. Instead of urging his suit with the respect due to the sovereign, Graham rose with an enraged countenance, and seized the king, saying, "I arrest you in the name of all the three states of your realm here assembled in parliament, for as your people have sworn to obey you, so you are constrained by an equal oath to govern by law, and not to wrong your subjects, but in justice to maintain and protect them." This project having failed, Graham resolved to accomplish the death of the king by a conspiracy, which he put in execution during the festival of Christmas, which James held at Perth. Here, in conjunction with sir John Hall and his brother, they barbarously murdered the king, in the 44th year of his age, and the 13th of his active authority. He was a prince of superior abilities, and may justly be considered among the greatest of the Scottish monarchs. If his measures were sometimes severe, they are perfectly defensible upon the principles of sound policy. He had to deal with a set of men who regarded the virtue of moderation as imbecility, and whose lawless habits could only be restrained by the most summary examples of justice. The frequent meetings of the states of the kingdom during his reign, and his constant deference to their decision, shew that James was not a tyrant. His patronage of learning and of the useful arts, evinces that the grand object of his ambition was the improvement and benefit of his country.

James II., who was only seven years of age at his father's death, was crowned king at Edinburgh on the 25th of March 1438. At the same time a parliament was assembled, and denounced the severest penalties of the law against all those concerned in the regicide. The first taken were sir Robert Stuart and sir Christopher Chambers, who were executed at Edinburgh. Athol was next seized, and beheaded at the same place; and Graham, with many others, soon after shared a similar fate at Stirling. Even at the moment when he was writhing under the agonies of the most cruel tortures, that daring chief of the assassins had the boldness to declare that his conduct was fully justified by the tyranny of the king, and that his judges and the people ought rather to applaud him as a patriot; than condemn him as a traitor. The minority of the new king having rendered a regency necessary, Archibald, earl of Douglas, assumed the direction of affairs with the consent of the parliament; but that nobleman unfortunately died within the year. The states of the kingdom afterwards divided the government between sir William Crichton, as chancellor, and sir Alexander Livingston, as keeper of the king's person, with the title of governor. This proved a most unfortunate partition of power; for the chancellor and governor soon quarrelled; and the former seized the person of the sovereign, and counteracted all the edicts of his colleague by contrary proclamations. The queen-mother, however, who was inimical to Crichton, contrived to steal her son from his custody, and fled with him to the castle of Stirling. In this juncture the chancellor applied to the young earl of Douglas for his support; but he haughtily answered, that he was an enemy to all parties, and was determined to assume the government himself. Crichton was thus convinced of the necessity for a union to guard against these arrogant pretensions; and accordingly a compromise with Livingston took place in Edinburgh; by which it

SCOTLAND.

was agreed, that the king should remain in the custody of the latter.

In the interim, the earl of Douglas continued to brave the power of the government in a manner amounting to open rebellion, which highly exasperated the chancellor in particular; and as he knew the earl was above the reach of the law, he resolved to get rid of him by summary means. With this view he invited him to attend a parliament then about to be held at Edinburgh, and having inveigled him and his brother into the castle, on the pretence of dining with the king, ordered both to be executed on the Castle-hill. The young monarch endeavoured to save them; but the chancellor was fixed in his purpose, and had already ventured too far to recede with safety.

James, as soon as he attained his 14th year, declared himself of age, and took the reins of government into his own hands. The numerous friends of the young earl of Douglas now strove to reconcile him to the prince; and an accident soon happened which led to the fulfilment of their wishes. That was the murder of sir Robert Semple, of Fullwood, by one of the earl's partizans, who was in consequence arrested. Douglas, anxious to save his life, repaired to Stirling, threw himself at the king's feet, and implored his pardon, solemnly promising that he would ever afterwards conduct himself as a dutiful and loyal subject. His submission was joyfully received by James, and he was immediately admitted into the royal councils.

Alarmed at this event, the chancellor resigned the great seal, and took possession of the castle of Edinburgh, the custody of which he pretended had been committed to him by the late king, till his son should arrive at the age of 21 years. Livingston also resigned all his posts, except the command of Stirling castle, which he retained upon the same pretence.

James demanded the immediate surrender of both fortresses, and the demand being refused, the estates of the offenders were confiscated. The result was a civil war, during which almost every corner of the country presented a scene of desolation and bloodshed. It terminated by the reconciliation of Crichton to the king, and the sacrifice of Livingston to the vengeance of Douglas.

The king, now in his 18th year, was married to Mary, the daughter of Arnold, duke of Gueldres; but this event provoked the hostility of England, and a war immediately ensued. An English army advanced into Scotland, as far as the river Sark in Annandale, where it was totally defeated by Douglas, earl of Ormond. Next year a truce was concluded for an indefinite period, which bore this singular clause, that either party might violate it upon giving 180 days' notice. The royal bride having arrived in Scotland about this time, her marriage was solemnized with great pomp at Holyrood House, an event which put an end to the influence of Douglas, who retired to his estates. James, being thereby emancipated from thralldom, summoned a parliament, in which many salutary enactments were made, tending to curb the power of the aristocracy, and to ensure the tranquillity of the kingdom. One act of this parliament deserves particular attention. It ordained, that if any man should "commit or do treason against the king's person or his majesty, or rise in war against him, or lay hands upon his person violently, of whatever age the king be, young or old; or receive any that have committed treason, or that supply them with help or advice, or garrison the house of them that are convicted of treason, and hold their houses against the king; or garrison houses of their own in assistance of the king's rebels, or that assault castles or places where the king's person shall happen to be, without the consent

of the three estates, shall be punished as traitors." This statute has occasioned altercations between the favourers of monarchy, and those who attach ideas of freedom to a parliament of the middle ages; though, in fact, the only dispute lay between monarchy and aristocracy. Many other statutes were passed to increase the power of the sovereign.

Douglas, chagrined at the loss of his power, and wishing to display his pomp to the continental princes, went to the jubilee at Rome with a train of six knights, fourteen gentlemen, and eighty inferior attendants. In his absence many complaints were made against his dependants, which so enraged James, that he seized upon the castle of Lochmaben, and demolished that of Douglas. The earl, on his return home, sent a submissive message to the king; and as he could not in equity be reputed guilty of events which happened without his knowledge, he was graciously received; but he soon proved himself unworthy of confidence, by engaging in treasonable practices, and soliciting the protection of England. Douglas having been prevailed upon to visit the court of Stirling, was conducted into a secret chamber, where James mildly told him that he knew of the league he had made, and advised him to break off all such illegal engagements. The earl treated the proposal with his usual arrogance, whereupon the king, roused to momentary fury, exclaimed, "If you will not break this league, by God I shall," and drawing a dagger, instantly stabbed Douglas.

The brother and successor of the late Douglas was reconciled to the king, and entered into a solemn engagement; 1st, not to pretend any title to the earldom of Wigton, except with the queen's consent; 2dly, nor to the lands of Stewarton, a part of the patrimony of the duchess of Towrairie, his mother; 3dly, to abandon in future all hatred or enmity against all persons; 4thly, to preserve the public peace, and make compensations to persons already injured; 5thly, to observe the strictest duty and respect to the king. This instrument, which was signed by Douglas and lord Hamilton for themselves and their adherents, affords a curious picture of the state of government and manners in the age.

The interval of domestic quiet which succeeded this reconciliation was only of short duration; but it was marked by an event of some interest in the history of Scottish learning, *viz.* the foundation of the university of Glasgow, through the munificence of bishop Turnbull. The standard of rebellion was again raised by Douglas, aided by the Yorkist party in England. The king, aware of this conspiracy, summoned Douglas to appear before the privy-council; and upon his refusal ravaged his estates, and besieged his castle of Abercorn. The earl of Crawford advanced with an army to its relief, determined to force his sovereign to fight or fly the kingdom. James, distrusting the loyalty of the southern counties, hastened to St. Andrews, whence, by the advice of Kennedy, bishop of that see, he issued a proclamation, summoning the array of the north, and offering an annuity to all who should join his service. In a few days he found himself at the head of a numerous body of troops, with whom he marched against Douglas, whose army was encamped on the banks of the Carron. The effect produced was almost miraculous, for in less than twenty-four hours, Douglas was deserted by his whole army, excepting the persons who formed his household. Upon this unexpected change, he fled to Annandale, and afterwards to England.

James next proceeded to crush the remaining partisans of the insurrection, and to reduce the castles of Abercorn and Strathavan, which still resisted his authority. He afterwards assembled a parliament at Edinburgh, in which

SCOTLAND.

the forfeiture of the earl of Douglas, with his mother and brothers, was solemnly decreed. In another parliament held in the same year, several important and interesting enactments were made, tending to confirm the paramount power of the king, and to sap the foundation of the feudal system.

He next turned his attention to the subjects of foreign policy: enraged at the conduct of England for supporting the Douglasses, he invaded that kingdom, and spread desolation throughout the northern counties. Meanwhile Douglas was admitted to the titles of an English subject, and continued in that allegiance till his death.

Not long after this invasion, a truce was negotiated with England, and James returned to his favourite occupation, the enactment of laws for the improvement and tranquillity of the country. In the several parliaments held at Edinburgh, measures were taken to reform the coinage, and to regulate the internal commerce of the kingdom; a regular militia was established for the national defence; and several laws were made to promote agriculture, and to fix the constitution of parliament. But the most important act passed in this reign relates to the establishment of a supreme court of justice, independent of the king's council. This court consisted of three eminent clergy, three barons, and three commissioners of burghs, to be changed each month. It was, in fact, a committee of parliament, the members having been taken in rotation from that assembly; and no appeal lay from its decisions.

While these matters were under consideration in Scotland, England was distracted by the rivalry of the houses of York and Lancaster. James seems to have inclined to favour the former, but took no active part on either side till the captivity of Henry VI., when he commenced hostilities, by laying siege to the castles of Berwick and Roxburgh. The latter enterprise he conducted in person; and here he unfortunately met his death, by the accidental bursting of a cannon, on the 3d of August, 1460. The nobility who were present concealed his death, from the fear of discouraging the soldiers; but the spirited conduct of the queen soon rendered this precaution unnecessary. Her young son, James, having arrived in the camp a few hours after, she presented him to the army as their king, and declared she would act the part of their general herself.

Accordingly she assumed the reins of government, and pushed the siege of Roxburgh castle with so much vigour, that the garrison was obliged to capitulate in a few days; after which the army took and dismantled the castle of Werk. In 1466, negotiations were begun for a marriage between the young king and Margaret, princess of Denmark; and in 1468, the following conditions were stipulated; 1st, that the annual rent hitherto paid for the northern isles of Orkney and Zetland should be for ever remitted and extinguished: 2dly, that Christiern, then king of Denmark, should give 60,000 florins of gold for his daughter's portion, whereof 10,000 should be paid before his departure from Denmark; and that the islands of Orkney should be made over to the crown of Scotland, by way of pledge for the remainder; with this proviso, that they should return to that of Norway after complete payment of the whole sum: 3dly, that king James should, in case of his dying before the said Margaret his spouse, leave her in possession of the palace of Linlithgow and castle of Down in Mentieth, with all their appurtenances, and the third part of the ordinary revenues of the crown, to be enjoyed by her during life, in case she should choose to reside in Scotland: 4thly, but if she rather chose to return to Denmark, that in lieu of the said life-rent, palace, and castle, she should accept of 120,000

florins of the Rhine; from which sum the 50,000 due for the remainder of her portion being deducted and allowed, the islands of Orkney should be re-annexed to the crown of Norway as before. When the completion of these articles became necessary, Christiern found himself unable to fulfil his part of them. Engaged in an unsuccessful war with Sweden, he could not advance the 10,000 florins, as agreed to. He therefore applied to the plenipotentiaries to accept of 2000, and to take a mortgage of the isles of Zetland for the other 8000. This treaty led to the final annexation of Orkney and Zetland to the Scottish crown.

In 1476 those misfortunes began to assail James, which afterwards terminated in his ruin. He had made his brother, the duke of Albany, governor of Berwick; and had entrusted him with very extensive powers upon the borders, where a violent propensity for the feudal habits still continued. The Humes and the Hepburns could not brook the duke of Albany's greatness, especially after he forced them, by virtue of a late act, to part with some of the estates which had been granted them in the preceding reign. The pretended science of judicial astrology, by which James happened to be infatuated, was the easiest, as well as the most effectual engine that could work their purposes. One Andrew, an infamous impostor in that art, had been brought over from Flanders by James; and he and Schevez, then archbishop of St. Andrews, concurred in persuading James that the Scotch lion was to be devoured by his own whelps.

In 1482, the king began to feel the bad consequences of taking into his councils men of worthless character. His great favourite at this time was Cochran, whom he had raised to the dignity of the earl of Mar. All historians agree that this man made a most infamous use of his power. The other minions of the king were James Hommil, a taylor; Leonard, a blacksmith; and Torislaw, a dancing-master, whose professions rendered them wholly unworthy of the royal countenance. The favour shewn to these men gave such offence to the nobility, that they resolved to remove the king, with some of his least exceptionable domestics, to the castle of Edinburgh, and to hang all his favourites over Lawder bridge, both which measures were accomplished with the most spirited resolution. During his confinement, James conducted himself with great firmness, refusing all terms of compromise with those who had seized his person, or were engaged in the execution of his favourites. Having been liberated by his brother, the duke of Albany, he immediately repaired to Holyrood House, whither most of his nobles came to pay their respects to him; but so much was he exasperated by their conduct, that he imprisoned no fewer than sixteen. Albany was appointed chief minister, and became a great favourite; but this cordiality did not last long; for in less than three years we find Albany solemnly denounced a traitor by act of parliament. During all this period, hostilities were carried on with the English government; but a truce was agreed to in 1484; and James, finding himself in tranquillity both at home and abroad, insensibly relapsed into his former impolitic system. The result was, an association of several of the most powerful barons, who seized the person of the heir apparent, and induced him to put himself at their head. James at this period was making progress and holding courts in the North; but immediately on hearing of the insurrection he hurried to Perth, which he appointed as the place of rendezvous for his army. When the whole were assembled, he marched to Stirling, where he first learned that his son commanded the rebel forces who were advancing from the east. Both armies drew up in battle array, nearly on the same ground

SCOTLAND.

ground which had been already consecrated by the victory of Bannockburn. At first the rebels gave way; but being supported by their second and third lines, the royalists were in turn forced to retreat. This event, and the cowardly flight of the king, terminated the action with little effusion of blood. James, in passing through the village of Bannockburn, was thrown from his horse, and carried into a mill, where he was stabbed by one of the rebels, who, pretending to be a priest, was conducted to him by the miller's wife. Thus perished a prince, whose natural goodness deserved a better fate, than to fall the victim of a lawless aristocracy, more inimical to public order than the feeble despotism of their sovereign.

The duke of Rothsay, apprised of his father's fate, assembled a parliament at Edinburgh, in which several of the friends of the late king were arraigned for high treason. He afterwards made a progress throughout the kingdom, and endeavoured to acquire popularity. In that object, however, he was not immediately successful, as we find the early part of his reign was disturbed by a formidable rebellion. The leader of this insurrection was the earl of Lenox, who was defeated and taken prisoner at Tilly-Moor. James, however, afterwards became a great favourite with the nation, on account of his zeal for the improvement of the kingdom. The arts of ship-building and of architecture were particularly the objects of his patronage; and indeed to so high a pitch did he carry his anxiety to establish a navy, that he brought himself into serious financial difficulties. This distinguished monarch closed his reign and his life in the celebrated field of Floddon, where most of his nobility perished with him.

James V. now ascended the throne, though only a year and a half old. The long minority which ensued was remarkable for internal intrigue, and particularly for the fixed establishment of the French and English factions in Scotland, which continued to distract the kingdom, more or less, till the close of its existence as a separate and independent state. From this circumstance the history of Scottish affairs increases in interest, as becoming more intimately connected with the general history of Europe; but as the limits of this article will not permit of their being detailed at length, their bearings cannot be pointed out in a satisfactory manner.

The parliament, which met immediately after the fatal battle of Floddon to deliberate on the critical situation of the kingdom, elected the queen-mother to the regency. This princess conducted the government with great wisdom and energy; but having unhappily married the earl of Arran, that step gave occasion to violent intestine commotions. By the constitution of Scotland, a marriage under the circumstances of the queen regent was a virtual resignation of her authority; and as Arran was not a favourite with the nobility or the nation at large, parliament refused to continue him in power. The duke of Albany was therefore appointed regent; and a deputation was immediately sent to France to request his acceptance of that station. On his arrival in Scotland, he was received with every mark of respect; but as he attached himself closely to the French interest, the English party, headed by the queen and lord Hume, opposed him in all his measures, and excited commotions in different parts of the country. Henry VIII. of England declared war against him; and though it does not appear that the regent feared the issue of a contest, he nevertheless soon found it necessary to make peace, on account of the dissensions that prevailed in the army, which he had led to the borders with the view of invading England. Shortly afterwards, the increasing opposition manifested

against his authority induced him to resign the regency; when the sovereign power was again assumed by the queen. Arran, by seizing on the person of the king, and pretending to rule in his name, soon overthrew the party of the queen; but his own elevation was not of much longer continuance; for the king, having escaped from his custody, seized the reins of government himself, and not only deprived Arran of all his dignities, but had him denounced in parliament as a traitor.

Thus, freed from the controul of all parties, James displayed an excellent capacity for government. He called frequent parliaments, and directed their attention principally to the improvement of his kingdom. In 1532 he instituted the court of session, on the model of the parliament of Paris. This court originally consisted of fifteen members, half clergy and half laity, and was empowered to give decisions in all civil suits.

The years immediately succeeding that last-mentioned, were marked by the most horrid atrocities, committed in the name of religion. Many persons of distinguished rank suffered at the stake for their opinions. A court of inquisition was established, of which sir James Hamilton was appointed president, and certainly no man ever shewed himself more worthy of his mercilefs station. During the same period the Scots had to deplore the miseries of a war with England, which raged for two years with various success. But notwithstanding these misfortunes, Scotland continued to rise in power and importance. The friendship of James was anxiously sought by all the great European sovereigns. Even the pope sent an ambassador to the Scottish court, and conferred upon James the title of "Defender of the Faith."

In the year 1536, the king negotiated a treaty of marriage with Marie de Bourbon, which was solemnly ratified by the French king; but it was afterwards annulled by the visit of James himself to the continent, where he espoused Magdalen, the daughter of Francis, who died in less than two months after her arrival in Scotland. The Scottish king, however, did not long remain a widower; for in 1538 he espoused Mary of Guise, dowager duchess of Longueville.

In 1540 a parliament was held at Edinburgh, in which an act of indemnity was passed for all offences committed during the king's minority. Shortly after war broke out with England, and the duke of Norfolk invaded Scotland; but was compelled to retreat by the skilful movements of the earl of Huntley. James resolved to pursue this advantage by penetrating into England; and the expedition would most probably have been successful but for the appointment of an unworthy favourite to the chief command in the moment of attack, which so much disgusted the nobles, that they chose rather to surrender to the English, than submit to his orders. This disgraceful occurrence happened at Solway Moss; and produced such an effect upon the mind of the king, that it brought him to his grave, in the 31st year of his age.

Mary, his infant daughter by Mary of Guise, succeeded to the throne, and cardinal Beaton, who had been for many years prime minister, assumed the regency; in virtue of a pretended testament which he himself had forged in the name of the late king. The earl of Arran, the next heir to the crown, was however elected to the regency by the nobles; and thus new jealousies were excited. The English monarch proposed his son Edward as a match for the young queen, but this was opposed by the regent. A war was the consequence; but it was soon terminated by a peace negotiated with the French king, in which Scot-

SCOTLAND.

land was included. Shortly after this, cardinal Beaton fell a sacrifice to the hatred of the reformers, who were particularly incensed against him for the barbarous execution of one of their champions, named Wishart. This event proved fatal to the Catholic religion, and to the French interest in Scotland; for though a large party in the nation still continued zealously attached to both, the loss of so bold and skilful a leader rendered their influence and exertions much less effective.

In September 1547, Henry VIII. being deceased, the protector, Somerset, in pursuance of the intentions of his late master, entered Scotland with a large army, and having engaged the Scots, commanded by the regent in person, at Pinkie, near Musselburgh, gained a complete victory. Above ten thousand men fell on this day, which was scarcely less disastrous to Scotland than the fatal one of Flodden. The victory, however, was of little advantage to the protector, whose cruel ravages only increased the aversion of the Scots to unite with England; and induced them to form a close alliance with France. The queen dowager, who, after the death of Beaton, took a considerable share in the direction of affairs, seized every opportunity to promote this object. By her advice ambassadors were sent to the court of Henry II. to offer the young queen in marriage to the dauphin; and accordingly a treaty was concluded, by which the parties were betrothed, and the Scots became bound to send Mary to receive her education in France. In vain did a few patriots remonstrate against such extravagant concessions, by which Scotland was made a French province; and Henry, from an ally, raised to be master of the kingdom.

While Mary was enjoying the pleasures of the court of France, the only scene in which she ever experienced the smiles of fortune, Scotland, first under the regency of the earl of Arran, who had been dignified with the title of duke de Chatellerault, and afterwards of the queen dowager, Mary de Guise, was rent by factions, and experienced all the direful effects of religious and feudal dissensions. The whole time which had elapsed from the death of James V. had been a season of anarchy, during which parties had risen and fallen in rapid succession. To the commotions so common in every country, while the feudal system was in its vigour, and in none more than in Scotland, may be added those caused by the collision of the principles of the reformation, with the interests of a powerful hierarchy. Throughout Europe the wealth of the church was exorbitant; but in Scotland it so far exceeded the just proportion, that not less than half of the national property was possessed by ecclesiastics. The mode of its disposal likewise considerably increased their influence. Church lands being let on lease, at an easy rate, and possessed by the younger branches of the great families, many estates in all parts of the kingdom were held of the church. This extraordinary share in the national property was accompanied by a proportionable weight in the national councils. The number of temporal peers being small, and the lesser barons and representatives of boroughs seldom attending, the ecclesiastical members formed a very considerable body in the Scottish parliaments, in which they possessed all the influence that exorbitant wealth and superior talents could give.

A hierarchy established on so firm a basis, with so many pillars for its support, it was difficult to overturn. The progress of the reformation, however, gave a serious alarm to the clergy, and the sword of persecution was effectually drawn in defence of the privileges and emoluments of the Catholic church.

In spite of all these difficulties, however, the reformed

religion was established in Scotland, by act of parliament, in 1560, and the exercise of religious worship, according to the rites of the Popish church, was prohibited, under the penalty of forfeiture of goods for the first, banishment for the second, and death for the third offence. "Such strangers," says Dr. Robertson, "were men at that time to the spirit of toleration, and to the laws of humanity; and with such indecent haste did the very persons who had just escaped the rigour of ecclesiastical tyranny proceed to imitate those examples of severity, of which they themselves had so justly complained." The new system of church government, however, was yet to be modelled; and in this business Knox, a popular preacher, of a rude but energetic eloquence, of rigid morals, and republican ferocity, had a principal share. This reformer had long resided at Geneva, and considered the system of church government established by Calvin in that city, as the most perfect model for imitation. He, therefore, recommended it to his countrymen, and succeeded in accomplishing its establishment.

When Mary returned to Scotland, she was received by her subjects with every demonstration of joy. Never did a prince ascend a throne under circumstances of greater difficulty, or conduct herself at first with more prudence. Finding the Protestant religion completely established over the whole kingdom, she very properly took into power the most eminent men of that party; and, to remove all dread of molestation from the minds of their followers, she formally declared, "that until she should take final orders concerning religion, with advice of parliament, any attempt to alter or subvert the religion which she found universally practised in the realm, should be deemed a capital crime." The division of the property of the church, and the settlement of the Protestant revenues, however, soon gave rise to animosities; and the queen, in her anxiety to please both parties, lost the confidence of the Papists by her concessions to the Protestants, while the latter were offended at the small share of spoil which was declared to accrue to them. Dissensions broke out among the nobility; and particularly between the earls of Marr and Huntley. The latter, who was a zealous Catholic, pressed the queen to restore popery; and finding his counsels neglected by the influence of Marr, first attempted to assassinate him, and thereafter raised the standard of rebellion against his sovereign. The earl of Murray marched to oppose him, and after a bloody contest put his forces to the rout.

The year following these transactions, Mary, who was desirous of entering into a more intimate correspondence with Elizabeth, employed Maitland to desire a personal interview with her, but the English queen declined the meeting. In 1563, the Scottish sovereign avowed her determination to contract a second marriage, an event for which the nation in general was extremely anxious, in order that the crown might be continued in the right line of its ancient possessors. Many suitors of great eminence, among the princes of Europe, presented themselves; but these were all rejected in favour of Henry Stuart, lord Darnley, eldest son of the earl of Lenox, who had been forced to seek refuge in England in the reign of James V. The royal nuptials were celebrated in July 1565, in conformity to the rites of the church of Rome; and not content with elevating this undeserving man to her bed, the queen issued proclamations at the same time, conferring upon him the title of king of the Scots. All those who had opposed the marriage were treated with great severity; particularly the earl of Murray, who, having taken up arms, was defeated, and compelled to fly the kingdom.

With

SCOTLAND.

With this rash step began the misfortunes of Mary. Henceforth her life is one continued scene of political folly, and personal imbecility. Instigated by hatred to all those who manifested an aversion to Darnley, she renounced that prudent conduct which had hitherto enabled her to maintain the dignity of her crown in the midst of conflicting factions. Her Protestant counsellors were now dismissed; she joined the league of Catholic princes against the reformers; and evinced her full determination to restore the Romish religion in Scotland. The effects of this new system of policy soon became visible. The time of the prorogation of parliament was shortened; and by a new proclamation, the 12th of March was fixed for its meeting. Mary resolved, without further delay, to proceed to the attainder of the malcontent nobles, and at the same time to take some measures towards the re-establishment of her favourite worship. The ruin of Murray and his party seemed now inevitable, and the danger of the reformed church imminent, when an event unexpectedly happened which saved both. This was the murder of Rizzio, the queen's favourite, by her husband, and several of the nobility, in her own presence, which roused her indignation to the highest pitch, and completely alienated her affections from Darnley, who had already disgusted her by his insolence and his licentiousness. Having been confined, however, by the conspirators, she was obliged to dissemble, in order to detach the king from their party, a project in which she completely succeeded, and thus was enabled to regain her liberty. Murray and the exiled nobles were immediately received into favour; and Morton, and the rest of the murderers, were compelled to seek safety in England.

The charm, which had at first attached the queen to Darnley, and held them in a happy union, was now entirely dissolved; and love no longer covering his follies and his vices with its friendly veil, they appeared to Mary in their full dimensions and deformity. Though the king published a proclamation disclaiming all knowledge of the conspiracy against Rizzio, the queen was fully convinced that he was not only accessory to the contrivance, but to the commission of that odious crime. That very power, which, with liberal and un suspicious fondness, she had conferred upon him, he had employed to insult her authority, to limit her prerogative, and to endanger her person. Such an outrage it was impossible any woman could bear or forgive. Cold civilities, secret distrust, frequent quarrels, succeeded to their former transports of affection and confidence.

About this time a new favourite grew into credit with the queen, and soon gained an ascendancy over her heart, which encouraged him to form designs that proved fatal to himself and to Mary. This was James Hepburn, earl of Bothwell, the head of one of the most ancient and powerful families in the kingdom. When the conspirators against Rizzio detained her in custody, he became the chief instrument in recovering her liberty, and served her with so much fidelity and success, as made the deepest impression upon her mind. Her gratitude loaded him with marks of her bounty; she raised him to offices of dignity and trust; and transacted no matter of importance without his advice.

The hour of the queen's delivery now approached; and she was advised, for the sake of perfect security, to take up her residence in the castle of Edinburgh, where she was accordingly delivered of her only son, James, whose birth was happy for the whole island, and unfortunate only for her. His accession to the throne of England, united the two divided kingdoms in one mighty monarchy, and established the power of Great Britain on a firm foundation; while she, torn early from her son by the cruelty of her fate, was

never allowed to indulge those tender passions, nor to taste those joys, which fill the heart of a mother.

The queen, when recovered, did not evince any change of sentiment towards her husband. On the contrary, the breach between them became every day wider, notwithstanding the attempts of the French ambassador to effect a reconciliation. Her attachment moreover to Bothwell increased, in proportion as her love for Darnley declined. At length the latter was murdered by the explosion of some barrels of gunpowder, placed under the house he had been inticed to reside in at Edinburgh, and Bothwell was accused of and prosecuted for the murder, but was acquitted on a trial by his peers. Of his guilt, however, not the slightest doubt can be entertained; and it is much to be feared that Mary herself was accessory to the crime.

Bothwell now redoubled his assiduities to fix the affections of the queen, and having succeeded in that object to his utmost wish, he carried her to the castle of Dunbar, where she remained a willing prisoner, till matters were finally arranged for their nuptials, when she removed to Holyrood House, and was soon afterwards united to Bothwell, whom she created duke of Orkney. This step, the most unjustifiable of all her follies, was the prelude to her ruin. The nobles almost immediately confederated against her and Bothwell, who was obliged to seek refuge in England, while she herself fell into the hands of her incensed subjects. By them she was conducted first to Edinburgh, and subsequently to Lochleven castle. The confederate leaders assumed the title of lords of the secret council, and arrogated to themselves the whole regal authority. Deliberations were held to fix the destiny of the nation, and to determine respecting the person of the queen. The result was, that she was compelled to resign the crown in favour of her son, who was instantly proclaimed, and the earl of Murray was invested with the dignity of regent.

Matters being thus arranged, the first act of the regent was to call a parliament, in which all the measures of the confederates were confirmed. But notwithstanding this, Mary still had many friends who were ready to support her cause, if she could regain her liberty. Apprized of these favourable sentiments, she used every effort to effect her escape, and at length succeeded in her object, in a manner no less surprising to her friends, than unexpected by her enemies. By the influence of her charms, she captivated young Douglas, the brother of the owner of the castle, and prevailed upon him to join in a plot for her liberation. Accordingly, on the appointed night, having stolen the keys from his brother's room, he allowed Mary to pass out, and then locking the doors again, threw the keys into the lake. The queen entered a boat prepared for her, and landed safely on the shore, where she was received by lord Seaton, sir James Hamilton, and some other of her friends, who had been apprized of the plot. Instantly mounting on horseback she fled to Hamilton, where she was joined by a number of the nobility, and in a few days found herself surrounded by a formidable army. In this critical situation, the genius and prudence of the regent were eminently displayed. While he amused the queen for some days by negotiations, he employed himself with the utmost industry in drawing together his adherents from different parts of the kingdom. As soon as he was in a condition to take the field, he broke off the negotiation, and determined to hazard a battle. Mary, whose interest it was to delay the decision of her fate, imprudently favoured his wishes. She attacked his army in an advantageous position at Langside, and being completely defeated, fled to England, and threw herself upon the generosity of queen Elizabeth, by whom she was detained a prisoner for the

SCOTLAND.

the period of nearly twenty years, and was at last tried and executed upon an accusation of high treason. See MARY.

In the mean time the regent Murray, by his vigorous administration, soon restored Scotland to tranquillity; and continued to govern without any serious molestation till his death in 1570, by the hand of Hamilton of Bothwellhaugh. He was succeeded in his high office by the earl of Lenox, during whose rule, and that of his successors Marr and Morton, the kingdom was distracted by civil war. "Fellow citizens, friends, brothers, took different sides, and ranged themselves under the standards of the contending factions. In every county, and almost in every town and village, king's men and queen's men were names of distinction. Political hatred destroyed all natural ties, and extinguished the reciprocal good will and confidence which hold mankind together in society. Religious zeal mingled itself with these civil distinctions, and contributed not a little to heighten and inflame them."

Morton, the last regent, during the minority of James, having excited the enmity of several of the nobility, was accused of being accessary to the murder of Darnley, and suffered for that crime in 1581, though the proofs of his guilt were far from being satisfactory. After this event, James himself began to exercise the sovereign authority; but his love for favouritism proved prejudicial to his own peace and that of his kingdom, by fomenting jealousy among his nobles. One of these favourites, the earl of Arran, conducted himself in so arrogant and tyrannical a manner, that a confederacy was formed against him; and the king was forced to deprive him of all his offices and honours, and to declare him an enemy to the country.

James having been bred in the principles of the Protestant faith, exerted himself on every occasion to secure the reformed church from the danger of being overthrown by the Catholic party, which was synonymous with the queen's party, and continued to be very formidable so long as she lived. When his mother was put to death by queen Elizabeth, however, he remonstrated strongly against her conduct, and even declared war; but that wily princess soon found means to soothe his anger, and regain his friendship. During the whole of his reign, James was constantly in danger of his life from the plots of the Popish lords, towards whom he shewed more lenity than was probably politic or prudent. On one occasion his person was seized by Bothwell, but he happily contrived to escape from his power, before any of the ulterior objects of that bold measure could be effected. Several attempts to murder him were likewise made, by various persons; but the most dangerous, though unsuccessful, conspiracy formed against his life, was that usually denominated the Gowrie conspiracy, from the title of the principal actor, John Ruthven, earl of Gowrie. From the mystery in which all its circumstances are involved, it has greatly excited the attention of historians; some even questioning the existence of any plot, and maintaining that the king murdered the Ruthvens without any reasonable cause. This opinion, however, is justly considered by Dr. Robertson as extremely improbable; though it must be confessed that the conduct of James, and the impression on the public mind against him at the time, cast an air of great suspicion over the whole transaction.

From this period no event of material interest in the history of Scotland occurred till the year 1603, when the death of queen Elizabeth opened the way for the accession of James to the throne of England, and laid the basis of that more intimate union, which has since consolidated the power and resources, and raised to an unparalleled height the happiness, prosperity, and glory of our island. The

annals of the two kingdoms are henceforth so much identified, that it is scarcely possible to treat them separately. The reader is, therefore, referred for the continuation of the history of Scotland to the article ENGLAND. He will also find some details of portions of the subject under the words UNION, STUART, Prince CHARLES, and others, designating leading events or characters.

General Aspect of the Country, the Soil, and Climate.—The most prominent features in the general aspect of Scotland are its barren hills and mountains, and the numerous and extensive lakes which fill the intervening vallies. In some districts the hills are covered with herbage, but in general they exhibit only heath vegetating above peat, rock, or gravel: hence, whether the eye ascends the mountains, or glances over the vales, the scenery which is presented to the view, though often grand and picturesque, is seldom naturally rich. On the former, the signs of sterility are always apparent; and as the soil of the latter is usually mixed with the substances composing the hills, no high degree of fertility can be expected. These remarks apply to almost every part of the Highlands, which comprehend about three-fifths of the whole extent of Scotland. South of the Forth, however, and even in a few of the eastern counties farther to the northward, the character of the scenery is more improved, and the soil, though extremely various, is frequently as fertile as in any district of England. As to the climate of this kingdom, it is such as a knowledge of its latitude, and of its peculiar situation with regard to the Northern and Atlantic oceans, would point it out to be. Both on the eastern and western coasts, but particularly on the latter, rains are extremely prevalent throughout the whole year. Snow in general lies only for a short time, even in the central districts; for though it often falls in considerable quantities, it is seldom attended, as in some more southern counties, by intense and long continued frosts. The lowest average heat is 41°.11 of Fahrenheit, and the highest 50°.326; so that the annual average temperature of the whole kingdom may be computed to be from 45° to 47° of the same scale. It is remarkable that, in some of the vallies of Moray, the influence of the sun's rays is so assisted by circumstances, that corn ripens there as soon as in Yorkshire or Northumberland.

Rivers.—Scotland abounds with streams of various magnitude, most of which fall into the Northern or German ocean. The principal of them are the Tweed, Forth, and Tay, on the east coast; and the Clyde on the west coast. Tweed is a beautiful and pastoral river, which discharges its waters into the sea at Berwick. It is noted for its salmon fisheries, and for the circumstance of its forming the boundary for several miles between England and Scotland. The Forth and Tay both form large estuaries, called the Friths of Forth and Tay, which serve important purposes in commerce. On the former are situated the town and port of Leith, and on the latter the towns of Dundee and Perth. The salmon fisheries of the Tay are the most valuable in Great Britain, and afford a constant supply to the markets of London and Edinburgh. But Clyde claims a pre-eminence over all these rivers in commercial utility, and perhaps also in picturesque beauty. Taking its rise from a hill in Tweedale, it flows first in a northerly, and afterwards in a westerly direction, exhibiting in its progress much interesting scenery. On its banks are situated the towns of Lanark, Hamilton, Glasgow, Rutherglen, Dumbarton, Port-Glasgow, and Greenock.

The other rivers of Scotland, which deserve notice, are the Annan and Nith in Dumfriesshire, the Eden in Fifeshire, the Dee and Don in Aberdeenshire, the Spey in Banffshire,

SCOTLAND.

Banffshire, the Nefs and Beaully, which form the Moray Frith, and the Grady and Conan, which form the Frith of Cromarty.

Lakes and Lochs.—The numerous and beautiful lakes interspersed throughout Scotland, and especially throughout its mountainous tracts, constitute a very striking and interesting feature in its scenery. The chief in extent and beauty is that of Lomond, studded with islets, and adorned with shores of the greatest diversity. Eastwards from this lake are those of Kettering, Chroin, Achray, Vanachoir, and Lubnaig; all of them distinguished by singular and picturesque scenes. The lake of Menteith is also in this vicinity. In Galloway are many fine lakes, on the banks of one of which stands the village of New Galloway. Lochleven, in Fifeshire, derives fame at once from its beauty, and from its historical interest, as the residence of queen Mary, when a prisoner in the hands of the confederate nobles. The lakes formed by the Tay are both numerous and extensive: the principal of them are Rannock, Lyd-dock, Erricht, and Loch Tay. The last, in particular, is a grand and beautiful expanse of water, of such length as rather to resemble a noble river. Loch Nefs, in Invernessshire, is equally noted for its extent and the charms of its scenery. Its usual depth is from 60 to 135 fathoms; and hence is to be explained the phenomenon of its never freezing, even in the coldest winters. This lake forms part of the chain of lakes which intersect the kingdom, from the Moray Frith to the Atlantic ocean, which, we trust, are destined shortly to become of high importance in forwarding the commercial prosperity of the kingdom. The other chief lakes of Scotland are Loch Loil, Loch Naver, and Loch Shin, in Sutherland and Caithness; Loch Fainish, in Ross-shire; the Lochy and Laggen, in Invernessshire; and Loch Awe, in Argyshire.

Friths and Inlets of the Sea.—Scotland is much indented with arms of the sea, which enter deep into the land. This indentation is highly beneficial: it facilitates commerce, as each of these branches so far serves the purposes of a canal; it promotes the fisheries, as it brings them more within reach; and it renders the climate more temperate, from the influence of sea-breezes. As even the shortest description of these friths and inlets separately would extend this article much beyond its prescribed limits, we shall content ourselves with the bare mention of their names. Those on the eastern coast, beginning from the south, are the Frith of Forth, the Frith of Tay, the Moray Frith, the Frith of Beaully, Cromarty Frith, the Frith of Dornoch, Thurso and Dunnet bays, Kyle of Tongue, Loch Eribol, and the bay of Durness. Those on the west coast, beginning from the north, are Loch Inchard, Loch Laxford, Loch Affint, Loch Enard, Loch Broom, Loch Ew, Gairloch, Loch Torridon, Loch Carron, Lochalsh, Loch Duich, Loch Hourn, Loch Nevisli, Loch Aylort, Loch Moydart, Loch Sunart, Linnhe Loch, Lochiel, Loch Leven, Loch Creran, Loch Etive, Loch Melfort, Craignish, Loch Swain, Loch Killisport, Loch Tarbat, the Frith of Clyde, Loch Fyne, Loch Long, Loch Gair, Loch Streven, Loch Ryan, the bay of Glenluce, Wigton bay, Kirkcudbright bay, bay of Nith, and the Solway Frith. Most of the above rivers, lakes, friths, and inlets of the sea, are noticed under their respective names, or under those of the counties to which they more immediately belong.

Mountains.—The mountains of Scotland, as already mentioned, occupy a large proportion of its surface, and constitute a prominent and distinctive feature in its geographical character. The principal chains are the Grampian hills, the Pentland hills, and the Lammar Muir. The first ex-

tends almost entirely across the kingdom, from the vicinity of Aberdeen to the Cowal in Argyshire. In their western range, they form the southern boundary of the Highlands; and are celebrated in history for the stand made upon their acclivities, by the Caledonians under Galgacus, against the Roman general Agricola. The second chain commences near Edinburgh, and running southwards through Lothian, joins Tweeddale hills; and the third, beginning near the eastern coast of Berwickshire, stretches to the westward through the Merse. In the province of Galloway is a fourth extensive assemblage of hills, which do not, however, form an uniform chain. With respect to the other mountains of Scotland, they do not admit of arrangement into distinct groups; and, therefore, it will be sufficient to notice some of the more remarkable among them for size and elevation. Ben Nevis is the highest mountain in Britain, its summit being 4350 feet above the level of the sea. On its north-east side it presents a most prodigious precipice, nearly perpendicular, which is said to be 1500 feet in height. The prospect from this hill is truly sublime, and extends on all sides a distance of 80 miles. The next mountain in point of elevation is Cairngorm, or the Blue mountain, which is constantly covered with snow, and is remarkable for quartz of different colours, well known to lapidaries under the name of Cairngorms. The other chief mountains in this district are those of Braemar, Scairloch, and Ben Awn. To the Grampian ridge belong Ben Lomond, 3262 feet high; Ben Ledi, 3009; Ben More, 3903; Ben Lawres, 4015; Shihallion, 3564; and Ben Verlich, 3300; besides some scarcely less important elevations on the east. Mount Battock, in Kincardineshire, is 3465 feet high; and Ben Cruachan, a solitary hill in Argyshire, 3300. In the more northern division of the Highlands, the mountains are yet more numerous, but not so memorable. The chief of them are Ben Nevis, Ben Chat, Ben Chalker, Ben Golich, Ben Folskaig, Ben Nore, and the hills of Cuinak, all in Ross-shire; and Ben Ormord, Ben Cliberg, Ben Grim, the Paps of Caithness, Ben Hop, and Ben Lugal, in Caithness and Sutherland. Along the whole of the western coast, the scenery is bold and precipitous in its character. One part of it, extending from Loch Kichard 24 miles to the south, presents a most singular appearance, as if mountains had been broken in pieces, and small lakes interspersed among the fragments.

Mineral Products.—The mineral products of Scotland are numerous, and are, in many instances, supplied in such abundance, as to form important objects of traffic. Gold was formerly procured in the sands of Elvan, a rivulet which joins the Clyde; and a place still exists, called Gold-scur, where the Germans used to wash the sands; but scarcely any has been found recently. The silver discovered in Scotland has hitherto been of little account; the chief mine was that at Alva, which has latterly only afforded cobalt. Nor can Scotland boast of copper, though a small quantity was found in the Ochils, near Alva; and it is said that the islands of Zetland offer some indications of that metal. It has also been found at Colvend, in Galloway; at Curry, in Lothian; at Oldwich, in Caithness; and Kippert, in Ross-shire. The lead-mines in the south of Lanarkshire have been long known. Those of Wanlock-head are in the immediate neighbourhood, but in the county of Dumfries, and belong to another proprietor. These mines yield yearly above 2000 tons. The Sufannah vein, Lead-hills, has been worked for sixty years, and produced vast wealth. Some slight veins of lead have also been found in the western Highlands, particularly in Arran. Iron is found in various parts of Scotland; the Carron ore is the most

SCOTLAND.

most known, which Mr. Kirwan describes as being an argillaceous iron-stone of a blueish-grey, internally of a dark ochre-yellow. It is found in slaty masses, and in nodules, in an adjacent coal-mine, of which it sometimes forms the roof. At the Carron-works this ore is often smelted with the red greasy iron ore from Ulverston, in Lancashire, which imparts easier fusion, and superior value. Calamine and zinc are also found at Wanlock-head; and it is said that plumbago and antimony may be traced in the Highlands. Coal has been worked for a succession of ages. Pope Pius II., in his description of Europe, written about 1450, maintains that he beheld, with wonder, black stones given as alms to the poor of Scotland. But the use of this mineral may be traced to the twelfth century. The earliest account given of the Scottish coal is contained in a book published by one George Sinclair, who calls himself professor of philosophy at Glasgow, but his name cannot be traced in the university list. He explains with some exactness the manner of working coal, and mentions the subterraneous walls of whin which intersect the strata, particularly a remarkable one, visible from the river Tyne, where it forms a cataract, and passing by Preston-Pans to the shore of Fife. Mr. Williams has recently given his observations on this subject with much practical skill. The Lothians, and Fifeshire particularly, abound with this useful mineral, which also extends into Ayrshire; and near Irvine is found a curious variety, called ribbon coal. A singular coal, in veins of mineral, has been found at Castle-Leod, in the eastern division of Ross-shire. Among the less important minerals of Scotland, is the new earth found at Strontian, in the district of Sunart, and parish of Ardnarmurcan, Argyleshire, which is now introduced into numerous systems of mineralogy and chemistry. Ben Nevis affords beautiful granite. Fine statuary marble is found in Ailsyth, and at Blair Gowrie, in Perthshire. A black marble, fretted with white, like lace-work, occurs near fort William; dark brown with white at Cambuslang, Clydesdale. Jasper is found in various parts; Arthur's seat offers a curious variety: and on the western shore of Icolmkill, are many curious pebbles of various descriptions. Fuller's-earth is found near Campbelltown, in Cantire; and it is supposed that there must be a vast mass of talc, equal to that of Muscovy, in the mountains which give rise to the river Findom, as large pebbles of it are sometimes found in that stream.

Natural Curiosities.—Scotland, like other mountainous countries, abounds with singular scenes and natural curiosities. The caves on the shore near Colvend, in Galloway, are well worthy of notice; and the beautiful falls of the Clyde, near Lanark, have deservedly excited much attention. On the east of this part of Scotland, are the pastoral vales of the Tweed and Teviot, celebrated in song; the deep passes of the Peaths; and the romantic rock of Bas, the haunt of the folan goose. The basaltic columns of Arthur's seat, near Edinburgh, deserve inspection. On the northern shore of the Forth, near Dyfart, a coal-mine has, for ages, been on fire, probably from decomposed pyrites, and has supplied Buchanan with a curious description. The beauties of Loch Lomond have been often described, but the *trofac*, or singular hills around lake Ketterin, form a new acquisition to the traveller. The hills of Kinnoul, near Perth, constitute a great curiosity, presenting a mass of uncommon minerals. The numerous lakes and mountains need not be again mentioned. Many of the rocks off the coast of Aberdeenshire assume singular forms of arches, pillars, &c.; and the space from Trouphead to Portfyo abounds in uncommon rocks, and singular marine productions. The caves of Nigg, in Ross-shire, are worth visiting, and the more northern shores present innumerable wild scenes of

savage nature. Near Lathron, in Caithness, is a large cave into which the inhabitants sail to kill seals. Nofs Head presents a singular quarry of slate, marked with various metallic figures. The isles Stroma, near the northern shore preserve dead bodies for a long time without corruption. Near Tong is the cave Frafgill, about fifty feet high and twenty wide, variegated with a thousand colours, which are lost in each other with a delicacy and softness that no art can imitate. On the east of Durness is the cave of Smo, within which is the resemblance of a gate, succeeded by a small lake of fresh water, containing trout; the extent of this subterraneous lake has never been explored. The singularity of the coast of Edrachills, south of Loch Inchard, may likewise be mentioned as a natural curiosity, as may also the grand cataract of Kineag river, and the cave of Gandeman, near Ailsyth Point. The cascade of Glatma, in the heights of Glen Elchaig, is truly sublime, amidst the constant darkness of hills and woods. Ben Nevis will, of course, attract notice from its singular form and elevation. According to Mr. Williams, it consists of one solid mass of red granite, which he traced at the base for four miles along the course of a rivulet on the east; the height of this mass he computes at 3600 feet, and above it are stratified rocks, the nature of which he does not explain, but he says that those on the summit are so hard and tough, that wrought iron is inferior to them in these qualities. The stupendous precipice on the north-east side exhibits almost an entire section of the mountain. In Argyleshire the marine cataract of Loch Etif, the beautiful lake of Awe, and the environs of Inverary, present the chief objects of curiosity.

Sketch of the Agriculture.—Scotland, with respect to agriculture, exhibits great variations, from causes partly of a moral, but chiefly of a physical nature. To give his readers just ideas on this subject, sir John Sinclair, in his "General Report," has divided the country into nine districts, each distinguished by some peculiarities of surface, or relative circumstances, from the rest. The first district includes the counties of Roxburgh, Berwick, and the three Lothians, and may be justly termed, by way of eminence, the agricultural district, as the art of husbandry is carried on there in as great perfection as in any country in Europe. The proportion of land in cultivation is very considerable, and its farmers are, in general, remarkable for their intelligence, industry, and capital. In this district is situated the metropolis of Scotland, which unites to signal advantages of situation, a degree of art and elegance in its buildings, unknown in any other town in Great Britain. As it is the seat of the courts of law, the public offices, and a celebrated university, the population within its bounds is much greater than its agriculture or commerce would otherwise require. The several counties which compose this district may be thus discriminated. Roxburghshire, the most southerly, has a great extent of hills of considerable elevation, and only adapted for the pasturing of sheep; but it also includes the rich vale of Teviot, which is one of the most improved tracts in the kingdom. Berwickshire, though a large share of its surface is likewise best suited for pasture, contains in the Merse, soil at once fertile and well cultivated. East Lothian, throughout the greater part of its extent, is a rich and highly improved plain, diversified by a few gentle eminences; and yields to no county in Great Britain the palm of superiority in agriculture. Mid-Lothian, though inferior in soil to East Lothian, nevertheless raises excellent corn and green crops, and likewise derives wealth from horticulture in the vicinity of Edinburgh. West Lothian, besides being noted for the carefulness of its agriculture, in the more cultivated parts, is ornamented with many extensive plantations, while

SCOTLAND.

its peculiar situation on the southern bank of the Forth adds much to the beauty of the scenery, and to the advantages which the country possesses within itself.

The second district includes the counties of Peebles, or Tweeddale, Selkirk, Dumfries, Kirkcudbright, and Wigton. Here are the highest mountains south of the Forth; and from the great proportion of hills, and the small extent of arable land, more of the surface is appropriated to the feeding of live stock than to the growth of corn. Yet the vales, particularly in Dumfriesshire, are of considerable extent and fertility, and exhibit much diversity of appearance. The green hills of Tweeddale, and the intervening vallies, are prolific of corn. Only a small proportion of the territory, however, is arable, and late harvests occasionally blatt the prospects of the farmer. In the county of Selkirk, formerly called the Forest, a still less proportion of the land is cultivated; but new plantations begin to rise, and will in time supply the place of those natural woods, with which, several centuries ago, this county abounded. The hills, both in this county and in that of Peebles, are covered by numerous flocks of sheep, partly of the Tweeddale, but chiefly by the Cheviot race. Great numbers of cattle also are found in these districts. In Galloway, its excellent breed of cattle, and hardy race of sheep, are supported much better than formerly; and not only oats and barley, but wheat of good quality are raised in every part of the arable tracts. The valley of the southern Dee, in Kirkcudbright, has likewise been much improved; and though on the banks of that river there are neither coal-pits nor lime-quarries, yet imported coal forms the chief article of fuel, and imported lime the principal manure.

The third district is washed by the Atlantic ocean, and by means of a navigable canal communicates with the German sea. It includes the counties of Ayr, Renfrew, Lanark, and Dumbarton. Notwithstanding the humidity of the climate, from its exposure to the sea, and the extent and elevation of its hills, agriculture is much attended to, and in many parts is carried on with great success, as the exertions of the farmers are stimulated by commerce and manufactures. Still, however, this district is more adapted to the rearing or fattening of live-stock, than to the raising of corn; and the best breeds of horses and of dairy cows are to be found in it. From the concurring causes of commerce, manufactures, and minerals, agriculture has flourished in an ungenial climate; and nearly one-half, or, more accurately, seven-fifteenths of the whole surface are under cultivation. With only one-thirteenth part of the extent, nearly one-fourth part of the population of Scotland is included in this division.

In the fourth district are included the counties of Fife, Kinross, Clackmannan, Stirling, Perth, and Forfar or Angus. This district exhibits every variety of soil and surface, from the level and rich carses of Stirling, Falkirk, and Gowrie, and the great valleys of Strathmore, Athol, and Kethness, to the lofty Grampians, which shelter a considerable proportion of the division from the northern blasts. In the rich carses, and along the firths and sea-coast, it produces the best wheat, beans, barley, and broad clover. And in some of the inland districts are raised excellent crops of turnips, bear, and oats. Its live-stock in general is of an excellent description. The towns of Dundee, Perth, Alloa, Dumfermline, Stirling, St. Andrews, Clackmannan, Kinross, Forfar, Montrose, Brechin, and a number of inferior villages, contain two-fifths of its whole population. In this extensive district, Fifeshire is distinguished by its great variety of productions, and by its fisheries, its flax and linen manufactures, its coal-mines, lime-works, and iron-stone, by its improved agriculture, and its breeds of

cattle and horses. The small county of Kinross, ornamented by its lake, and abounding in coal and lime-stone, is considerably elevated above the level of the sea. Formerly it was not attractive to a stranger, but its aspect is now much improved. Clackmannan, of still more limited extent, but of greater fertility, is distinguished by a correct cultivation of the soil, and by the abundance of lime and coal. The half of its population resides in towns of very moderate extent. The county of Stirling includes every variety of soil, from the rich carses on the south bank of the Forth, to the barren rocks of Ben Lomond. In the parishes of Enrick and Strathblane, there are rich fields, cultivated by intelligent and enterprising farmers; and the scenery is much diversified in all parts of the country. The very extensive county of Perth is equally remarkable for the most fertile, and the most barren soils, and exhibits the two extremes of correct and defective agriculture. In the carse of Gowrie, and the valley of Strathearn, there are many opulent and enterprising farmers, who cultivate successfully the most fertile soil in the kingdom. In several of the smaller vales an improved cultivation is also general. But in the more remote highland gleis, even where the land is naturally good, improvements in agriculture are little known and less practised. In Forfarshire, along the sea-coast, and in the rich valley of Strathmore, the farmers have been long distinguished for their exertions; and in the inland parts of the county, shell-marle, obtained in abundance from the fresh-water lakes, has contributed very much to the improvement of the soil.

The fifth district includes the counties of Kincardine, Aberdeen, Banff, Moray, and Nairn, and contains a greater extent of sea-coast than any of the preceding divisions. Yet on the south-west, where it extends to the middle of the island, it is extremely mountainous; the Grampians stretching from its boundary with Perthshire nearly to the sea at Aberdeen. By far the greatest part of the arable land is either in the maritime or midland parts, there being very little near the mountains. It is remarkable, that the maritime parts of Moray enjoy perhaps the best climate in Scotland, and that for many centuries wheat has been cultivated there to great advantage. Wheat is also raised successfully in the maritime parts of Kincardine and Banffshire, and its cultivation is spreading rapidly in Aberdeenshire. The turnip husbandry and artificial grasses are to be met with over the principal part of this division in very great perfection. But the most striking feature in its cultivation is the great expence at which barren land is improved, by trenching with the spade and mattock, which has been known to exceed a hundred pounds for a single acre. This district in general raises food for the support of its inhabitants, and in good seasons exports a considerable quantity of grain; but it is chiefly distinguished for the rearing of excellent cattle, of which it sends yearly great numbers to England. Owing to the large proportion covered by mountains, only four eleventh parts of this district are as yet under cultivation. It is, however, much adorned by plantations, particularly near the houses of its proprietors, and its natural woods in Braemar are extensive and valuable. Kincardineshire, except that part of it which lies in Mar, is sheltered on the north by the Grampian mountains. This small county was early induced to attend to the cultivation of its soil, by the examples of the late Robert Barclay, esq. of Ury, and a few others of its landed proprietors. Aberdeenshire, which fifty years ago brought most of its work oxen from Fife and the Lothians, has now taken the lead in the rearing of black cattle, and cultivates for that purpose sown grass and turnips in great perfection.

SCOTLAND.

Wheat and beans also are raised successfully in the heavy loams of Forfar, and on the still heavier clays of Buchan. Banffshire owed much to a distinguished character, the earl of Findlater and Seafield, who introduced an improved system of cultivation in that county, and encouraged his farmers to imitate his example. Not only near the sea-coast of the Bogue and the Eurie, where that improved system began, but in the more inland parts, a spirit of improvement has now become general, and has greatly altered the face of the country. Though nature has done much for Moray, yet the culture of turnips and of sown grasses was not, till within the last thirty years, so general, as in less favoured counties; but of late, both these and corn crops, with the rearing of live stock, have been attended to with ardour and perseverance.

In the sixth district are included the two extensive counties of Argyle and Inverness, comprehending nearly one-fifth part of the whole surface of Scotland. About two-nineteenth parts of this district are cultivated, and productive. Near Inverness, at Campbeltown, in Argyleshire, and in some other spots, wheat and turnips are successfully cultivated, but in general the country is unfit for tillage, except on a small scale; its grazings, however, are extensive, and well adapted for the rearing of live-stock. It likewise contains a great extent of plantations, and the remnant of the Coclmore, or great forest of Scotland. The black cattle of this district are in high estimation as excellent feeders. The hardy breed of Tweeddale sheep, and in some instances those of Cheviot, occupy the hills. This division extends across the island; and the Caledonian canal is now carrying on directly through it, from the German sea to the Atlantic ocean, which it is to be hoped will carry industry and wealth into this remote district, and furnish the means of facilitating and enlarging the commerce of the other parts of the kingdom.

The seventh district includes the counties of Cromarty, Ross, Sutherland, and Caithness. It is in some respects superior to the former, though more northerly. East Ross, with a part of Cromarty, contains a considerable proportion of excellent soil; and both the wheat and turnip husbandry are carried on successfully. The eastern coast of Sutherland, and the plains of Caithness, are also good corn counties. West Ross, and by far the greatest part of Sutherland, of Cromarty, and of that portion of Caithness which bounds with Sutherland, are rugged and unproductive. Not a tenth part of this district is capable of being cultivated, and only a twelfth part of the people resides in towns or villages; yet, by the introduction of sheep-farming, by encouraging manufactures, and, above all, by the extensive fisheries of herring and cod, now successfully established along the coast of Caithness; this district must soon greatly increase in value, and the inhabitants become richer and happier. The breeds of cattle have been much improved of late years; the Tweeddale breed of sheep is now spreading over the western parts of this district; and there are already about 4000 of the Cheviot breed in various parts of it, more especially in Sutherland and Caithness. The Merino breed, and crosses of them, have been successfully introduced into Ross-shire, and other parts of this district. East Ross and Cromarty are ornamented with the seats of the proprietors, and extensive plantations. Wood also thrives in Sutherland, and in the more hilly parts of Caithness; but in the plains of Caithness, and near the sea-coast, it cannot be raised to advantage, from the nature of the subsoil, in general a gritty close gravel of little depth, incumbent on a horizontal flaggy rock, which keeps the water near the surface.

The islands which are included in the eighth district, were formerly denominated Ebudæ, but are now better known by the name of the Hebrides, or the Western Islands. They contain about one-tenth part of the total extent of Scotland, with about one-eighteenth part of its population. Of the whole surface, nearly one-seventh part is under culture. Wheat has been raised in some of the islands, more especially Bute, Islay, and Coll; and turnips have also been cultivated successfully in Skye, and some of the smaller islands. In all these isles the breed of black cattle is excellent, though in general small. The fisheries and kelp manufacture are very valuable; and by proper attention to them, these islands may furnish a great addition both to the wealth and strength of the empire.

In the ninth or last district are the northern islands of Orkney, and Zetland or Shetland. The former contain about 440, and the latter nearly 880 square miles, and form one county. Only about one-seventeenth part of the whole surface of these islands is in cultivation. Wheat and turnips have both been tried, and not without success. The pure Merino breed of sheep has been introduced into Orkney recently, and a zeal for improvement has lately appeared in these islands, which may be attended with the best effects; for they enjoy a very temperate climate, though in a high northern latitude. The isles being situated low, snow seldom lies many days, and ice is never more than two or three inches thick.

Forests and Woods.—That Scotland was anciently clothed with extensive and luxuriant forests, is abundantly proved by the concurring evidence of tradition, of history, and of the actual remains of their spoils. Innumerable places, where scarcely a tree is now to be seen, derive their names from the circumstance of their having been covered with wood, or from the particular kinds of timber with which they abounded; as Woodhead, Woodside, Aikenhead, Ashyhurst. The great forest of Selkirk, of which scarcely a trace remains, existed, as appears from ancient documents, as late as the 12th or 13th century; extending over the upper parts of Ayrshire, Lanarkshire, and Peeblesshire. The forest of Paisley seems to have communicated with that of Selkirk, extending, without much interruption, through the higher parts of Renfrewshire, the marches of Ayr and Lanarkshire by Loudon-hill, to near the shores of Galloway. The Caledonian forest, of which the Roman historians speak, appears to have extended in a southern direction to the English borders; and in a western, from the boundary of Stirlingshire, by Falkirk and Stirling, (including the higher grounds of St. Ninian, once the royal forest of Dundaff,) as far as Gartmore in Perthshire, covering the great moors, called Moors Flanders, through a tract of about twenty miles. Of this no trace remains, except Callendar Wood, and Tor Wood, unless we trace it, as we may, in the deep moors, from six to nine feet under the surface, incumbent on the clay, its original soil. Many other instances of ancient forests, long since lost, might be given from authentic records. In all our moors, from 20 feet above the level of the sea, to 500, and even 1000 feet above that elevation, the remains of trees of a much larger size than any which now exist in a growing state, are found in abundance. In the northern moors these are principally of the pine tribe. To the south of the Forth it does not appear that the fir ever grew spontaneously. The oak is, in that district, to be found every where imbedded in the moors. In Dalserf parish, in Lanarkshire, an oak was lately dug up 65 feet long, which is so straight, and so equal in girth, that it is difficult to determine which is its root end. In Moors Flanders, innumerable trees of the

SCOTLAND.

the same kind occur. Even the Hebrides, exposed as they are to the sea, present venerable remains of ancient forests. A yew tree, which grew on a sea cliff in the stormy island of Bernera, when cut into logs, loaded a large boat. The island has anciently been filled with woods. Though Lewis, adds Dr. Walker, is now entirely destitute of timber, there are large trunks of alder, birch, and especially of Scots fir, found in its extensive mosses. Of the destruction of these magnificent forests, we are furnished with a satisfactory account both by history and observation. Herodian and Dion Cassius inform us, that the emperor Severus, about A.D. 207, employed the Roman legions, with the auxiliary troops, and such of the natives as were under his controul, in cutting down the forests of Scotland, an undertaking, in which (the historian tells us) he lost no less than 50,000 men. The forest that once covered Moss Flanders, to the west of Stirling, appears evidently to have been thus cut down; the prostrate trees lie under the moss in every direction, which demonstrates that they have not been overthrown by storms, which would have laid them down uniformly. At a later period, John, duke of Lancaster, set 24,000 axes to work at one time to cut down the woods of Scotland. In the northern parts of Scotland, the Danes cut down and burnt many woods, as did king Robert Bruce in his expedition against Cumyn. Mr. Graham of Gartmore has in his possession an original document, relating to the woods of Aberfoyle, now the property of the duke of Montrose, formerly of the earl of Menteith and Airth. It is an order from general Monk to cut down the woods of Milton and Glehart, on account of the shelter they afforded to the rebels.

Government.—The political constitution of Scotland, since the Union, has been blended with that of England. Previous to that event, the parliament of Scotland was, like England, composed of peers and representatives of counties and burghs, with this distinction, that they sat in one house. That wise prince, James I. of Scotland, as has been mentioned, attempted to establish a house of commons, in imitation of that of England, but his subjects maintained the most firm resistance to that enlightened measure. The most distinguished feature of the ancient government is the general assembly. The high courts of justice, and particularly the court of sessions, may be classed in the next place. The lords of council and session are fourteen in number, besides a president; and on their appointment assume a title, generally derived from the name of an estate, by which they are addressed, as if peers by creation. The only appeal from this court is to the house of lords. It has long been a subject of regret, that the causes were not determined by jury, as in England. But this ground of complaint has been very recently removed, and three judges have been appointed to preside in a court where civil suits are to be determined by a majority of jurors. These judges have been named lords commissioners. The court of judiciary consists of five judges, all lords of sessions, with a president, styled the lord justice clerk, as representing the lords justice general. This is the supreme court of all criminal cases of importance, which are determined by the majority of a jury, and not by their unanimity, as in England. The court of exchequer consists of a lord chief baron, and four barons: in the court of admiralty there is only one judge.

The law of Scotland differs essentially from that of England, being founded, in a great degree, upon the civil law. It partly consists of statute law, but many of the ancient enactments never having been enforced, reference is made to the decisions of the court of session, which are carefully pre-

served and published, and which afford precedents generally reckoned unexceptionable. There is scarcely a vestige of common law, so that the civil and canon laws may be denominated the basis of Scottish judicature. The inferior courts are those of the sheriffs of counties, the magistrates of boroughs, the commissaries, and the justices of the peace. While the feudal system prevailed, the hereditary jurisdictions were nearly absolute, and every chief maintained an unlimited controul over the lives and property of his vassals and followers: but this system is now happily abolished.

Parliamentary Representation.—Scotland is represented in the British parliament by sixteen peers and forty-five commoners, in conformity to the treaty of union between the two kingdoms. The sixteen peers are elected for every new parliament by the whole body of the peerage duly qualified to vote at the period when the election takes place, and are not, when once elected, continued for life, as is the case in regard to Irish peers, by the recent union with Ireland.

The following table will give an idea of the diminution that has taken place in the members of the Scottish peerage since the Union, and their amount at present.

Tables of the Scottish Peerage.

1. Number of the Scotch peers at the Union,	-	154
2. The duke of Rothsay, when entitled to vote,	-	1
3. Added by subsequent orders of the house of lords,	-	4
		<hr/> 159
1. Extant, or dormant, including the title of Solway,	-	41
2. Merged in, or united to other titles,	-	10
3. Forfeited,	-	26
		<hr/> 77
	Remain	<hr/> 82

Of these, 23 (including the duke of Rothsay) are British peers, but who still retain the privilege of voting at elections, and even continue eligible; though it can hardly be supposed that these hereditary peers would persuade their brethren not enjoying the same privilege to elect them. At the last election, on the 13th of November 1812, there were three minors, three peeresses, and two Roman Catholics, consequently eight disqualified from voting. The peers who actually voted were fifty-two, and twenty-two were out of the kingdom, or did not vote.

Of the forty-five commoners, thirty represent counties, and fifteen boroughs.

The county members are elected by freeholders possessed of 400*l.* Scotch of valued rent, in land held of the crown. The only exception to this rule is found in the county of Sutherland; where, as the greater part of the land is held of the earl of Sutherland, it became necessary to give the vassals of that earldom a right to vote as well as the vassals of the crown; and in consequence of the inconsiderable number of small proprietors in the county, the qualification of the freeholder was reduced to 200*l.* Scotch of valued rent.

The following table shews the amount of the valued rent in each county, as it stood in 1674; also the number of qualified freeholders returned in the list drawn up for the year 1811, since which there has been very little variation.

SCOTLAND.

TABLE of Landed Representation.

Counties represented.	Valued Rent in Scotch Money.	No. of Freeholders.
	£ s. d.	
1. Aberdeen - -	235,665 8 11	147
2. Argyle - -	149,595 10 0	50
3. Ayr - -	191,605 0 7	146
4. Banff - -	79,200 0 0	35
5. Berwick - -	178,366 8 6 ⁷ / ₄	120
6. Bute & } per vices	15,042 13 10	17
7. Caithness } vices	37,256 2 10	21
8. Clackmannan & } per vices	26,482 10 10	19
9. Kinross } vices	20,250 4 3 ³ / ₄	15
10. Cromarty & } per vices	12,897 2 7 ⁸ / ₁₂	14
11. Nairn } vices	15,162 10 10 ¹ / ₂	22
12. Dumfries - -	158,502 10 0	74
13. Dumbarton - -	33,327 19 0	41
14. Edinburgh - -	191,054 3 9	125
15. Elgin - -	65,603 0 5	35
16. Fife - -	303,129 3 7 ² / ₃	207
17. Forfar - -	171,239 16 8	117
18. Haddington - -	168,873 10 8	70
19. Inverness - -	73,188 9 0	49
20. Kincardine - -	74,921 1 4	73
21. Kirkcudbright - -	114,597 2 3	135
22. Lanark - -	162,131 14 6 ³ / ₅ ³ / ₈	68
23. Linlithgow - -	75,018 10 6	62
24. Orkney and Zetland	57,786 0 4 ⁴ / ₁₀ ⁷ / ₈	27
25. Peebles - -	51,937 13 10	39
26. Perth - -	339,892 6 9	178
27. Renfrew - -	69,172 1 0	77
28. Ross - -	75,043 10 3	69
29. Roxburgh - -	314,663 6 4	133
30. Selkirk - -	80,307 15 6	37
31. Stirling - -	108,509 3 3 ¹ / ₂	98
32. Sutherland - -	26,093 9 9	28
33. Wigton - -	67,641 17 0	51

It is to be remarked, that six of these counties are represented in parliament by only three members, two of them united for that purpose electing a representative alternately, (a circumstance of a most particular nature, which is much complained of); and that the Zetland isles, owing to some defect regarding their valuation, though entitled to share in the representation of Orkney, have as yet no freeholders on the roll.

The fifteen members for royal boroughs represent in all sixty-six towns, whose united population amounted, in 1812, to about 500,000 souls; the number of voters, however, is very inconsiderable, consisting, in general, of the magistrates and town-council of the different boroughs only. The following are the towns from which members are sent.

	Members.
Edinburgh, including North and South Leith, and the West Kirk or St. Cuthbert's parish, -	1
Jedburgh, Lauder, Haddington, Dunbar, and North Berwick, -	1
Selkirk, Peebles, Lanark, and Linlithgow, -	1
Stranraer, Wigton, Whithorn, and New Galloway, -	1
Sanquhar, Kirkcudbright, Dumfries, Lochmaben, and Annan, -	1
Ayr, Irvine, Rothsay, Campbeltown, and Inverary, -	1

Glasgow, Rutherglen, Renfrew, and Dumbarton, 1
 Stirling, Culrofs, Dumfermline, Inverkeithing, and Queensferry, - 1
 Burntisland, Kinghorn, Kirkaldy, and Dysart, - 1
 Anstruther, East and West Pittenweem, Kilrenny, and Crail, - 1
 St. Andrew's, Cupar, Fife, Dundee, Perth, and Forfar, - 1
 Brechin, Abroath, Montrose, Berire, and Aberdeen, 1
 Kintore, Inverary, Banff, Cullen, and Elgin, - 1
 Forbes, Nairn, Inverness, and Fortrose, - 1
 Dingwall, Tain, Dornock, Urick, and Kirkwall, 1

State of Religion.—According to the present establishment of the church, Scotland is divided into 15 synods, comprehending 78 presbyteries, and 893 parishes, which are represented in the general assembly of the church, which meets annually at Edinburgh. In its deliberative and judicial capacity this ecclesiastical court is justly accounted among the most enlightened and respectable in the Christian world.

In the division of the country into synods and presbyteries, conveniency has been principally attended to, the limits of counties being no further observed than they are consistent with contiguity to the respective synodical and presbyterial seats; but in the arrangement of the whole into parishes, contiguity to the churches has not been so much observed. Hence, in many instances, remote parts are conjoined into one parish, to the great inconvenience of the parishioners, as well as of the officiating clergyman. With respect to extent and population also there is a great disparity; the first was settled in remote times; the second has been determined, in a great degree, by the effects of manufactures and commerce.

The names of the fifteen synods are as follow: 1. The synod of Lothian and Tweeddale. 2. The synod of More and Teviotdale. 3. The synod of Dumfries. 4. The synod of Galloway. 5. The synod of Glasgow and Ayr. 6. The synod of Perth and Stirling. 7. The synod of Fife. 8. The synod of Angus and Mearns. 9. The synod of Aberdeen. 10. The synod of Moray. 11. The synod of Ross. 12. The synod of Sutherland. 13. The synod of Argyle. 14. Glenelgh, or synod of Lochaber and the Isles. And, 15. The synod of Orkney. These synods come in the place of the bishops, and have jurisdiction in ecclesiastical questions; in regard to which there is an appeal from the presbytery to the synod, and thence to the general assembly.

In former times, particularly before the revolution in 1688, Scotland, with respect to ecclesiastical government, was divided into two archbishoprics, St. Andrews and Glasgow, and twelve bishoprics, Edinburgh, Dunkeld, Aberdeen, Moray, Brechin, Dumblane, Ross, Caithness, Orkney, Galloway, Argyle, and the Isles. The country in general was parcelled out among the respective sees, in an arrangement having some regard to contiguity, but not always so; for several parishes were attached to bishoprics, and many to the archbishoprics, that were very remote from the provinces in which they were locally placed. This still remains the case with the jurisdictions of the different commissaries, which have been substituted from these bishoprics, in what is called consistorial courts. At present, the Scots Episcopalians have only eight bishoprics, viz. 1. Edinburgh and Fife; 2. Glasgow; 3. Aberdeen; 4. Moray; 5. Ross; 6. Dunkeld; 7. Brechin; and, 8. Dumblane; comprehending seventy-six cures, served by sixty clergymen. The number of

SCOTLAND.

of their adherents is supposed to be about 19,000, which, perhaps, with the children, may amount to 28,000. The Roman Catholics divide Scotland into two districts only, the Lowland and the Highland, in order chiefly to make a separation between the two languages, the English and the Gaelic. Over each they have a vicar apostolic, and a bishop coadjutor. In the low counties they have about thirty officiating priests, and in the Highlands eighteen; hearers about 27,000 in number. The Seceders from the Scotch Presbyterian ecclesiastical church divide the country among them thus.

The Burgher Associate Synod lay it out in ten presbyteries. They have in all 130 congregations in Scotland, with about 66,000 hearers.

The Anti-Burgher Seceders divide it among three synods, containing eleven presbyteries. They have 134 congregations, with about 60,000 hearers. The church of Relief divides the country into six presbyteries, including 76 congregations, with about 50,000 hearers. The other presbyterian Scots, as the Cameronians, &c. may amount to about 14,000. The separatists of various persuasions, as Baptists, Brethren, Glaslites, may amount to nearly 50,000.

The Methodists, of whom there are supposed to be about 6000 members, or, including children, about 9000 souls, divide the country into circuits, eleven in all, served by eighteen preachers.

The Friends, or Quakers, are so few in number, that they have only five places of meeting, *viz.* Glasgow, Hawick, Edinburgh, Aberdeen, and Kinnack, near Old Meldrum; their whole number does not exceed 2000.

Chief Cities and Towns.—The most important towns in Scotland, both as to extent and population, are Edinburgh and Glasgow; the former the metropolis of the kingdom, and the latter the emporium of its manufactures and commerce. They both contain nearly the same number of inhabitants, *viz.* about 100,000 persons, and are royal burghs, governed each by a lord provost and town council. The next towns to these in importance are Perth, Aberdeen, Dundee, and Paisley, each containing about 30,000 souls. The other towns of note are Berwick, Dunbar, Haddington, Musselburgh, Aberbrothick, Montrose, Portsoy, Elgin, Inverness, and Dingwall, situated on the eastern side of the kingdom; Ayr, Greenock, Paisley, Inverary, and Campbeltown, situated on its western side; and Dumfries, Lanark, Stirling, Dunfermline, Dunkeld, Falkirk, Linlithgow, Hamilton, Selkirk, and many others little inferior to these, which are situated in inland counties. Many of the above towns enjoy the advantage of separate jurisdiction, but others are under the authority of the county magistrates, and of this class is Paisley, the greatest manufacturing town in Scotland next to Glasgow.

Manufactures and Commerce.—Previous to the Union, Scotland could boast little as to the extent either of its manufacturing or commercial prosperity. It is true, indeed, that tradition, as well as history, point out Perth as a great trading mart some centuries ago, but the accounts are most probably exaggerated. At all events, it is certain that the commerce of the kingdom was at a very low ebb during the seventeenth century, and that it has only risen into importance within the last fifty years. Formerly the staple manufacture of the kingdom was linen; but that has now given way, comparatively speaking, to the weaving of cotton goods. The chief seats of the former manufacture are Perth and its vicinity, and the county of Fife; and of the latter the counties of Lanark and Renfrew, including the towns of Glasgow and Paisley, and others of inferior note. Woollen cloths are only made for home consumption, and in trifling quantity, excepting carpets, the manufacture of

which is very considerable. Several other kinds of manufacture are carried on in Scotland, but that of iron is the only one which deserves to be specified in this article. The works of the Carron are probably the most celebrated in Europe for the founding of cannon, cast-iron wheels, &c.

With respect to the commerce of Scotland, it may be remarked, that though on a smaller scale, it is much assimilated to that of England. The chief exports are linen, grain, iron, glass, lead, soap, cotton goods of every description, also earthenware, cordage, leather, candles, and innumerable other articles, which it is unnecessary to mention. The imports are wines, brandy, and all kinds of colonial produce, likewise butter, linen, silk, wood, oil, and tallow. The principal ports are those of port Glasgow and Greenock, on the west coast, and Leith, Dundee, Perth, and Aberdeen, on the east coast.

To the above sources of Scottish commerce, may be very properly added the fisheries, which, if placed under appropriate regulations, would prove a fund of great wealth, not merely to Scotland, but to the British empire at large. To effect this object several enactments have been made, but their beneficial operation has hitherto been much restricted. A bill, however, is now in progress, which it is hoped will produce a more favourable result.

Roads and Canals.—In the Lowlands of Scotland the great roads are not inferior in formation to those of England; but they are not yet sufficiently numerous, nor are they always planned in the most judicious manner. Rapid improvements, however, are making in this branch of political economy, so indispensable to commercial prosperity, and the advancement of national civilization. From the mountainous character of the Highlands, the construction of good roads is perhaps impossible; but even in that wild district, efforts are daily making to render communication more easy.

The principal canal in Scotland is that which connects the navigation of the Clyde and Forth. It was begun in 1769, and constructed according to a survey furnished by Mr. Smeaton. The depth of this canal is seven feet, and its width at the surface fifty-six feet. In some places it is carried through mossy ground, and in others through solid rock, and appears evidently, throughout its whole extent, to have been planned and executed with great ability. Another canal has been proposed between Edinburgh and Glasgow, and is believed to be in progress of execution. There is also a canal forming across the isthmus of Cantire, to connect the Frith of Clyde with the Atlantic ocean, to the north of Jura. But the chief work of this description now going on, is the grand canal from the Moray Frith, through Loch Ness and Loch Lochy to the inlet of the sea called Loch Linnhe, on the western coast. Parliament has already voted a large sum towards this undertaking, which it is computed will require upwards of 400,000*l.* to complete it. See CANAL, *Inverness*.

Literature.—The literature of Scotland, though it cannot boast of great antiquity, has acquired a distinguished place in the annals of fame, by the rapidity of progress and brilliancy of its lustre in later times. The Culdees, indeed, the venerable hermits of Jona, are represented by ancient historians as having been men of extensive learning and great erudition; but their claims to this eulogy are probably overrated. The earliest genuine work relative to Scotland is the *Chronicon Pictorum*, written by an Irish clergyman, supposed, with considerable probability, to have been a dignitary of the church of Abernethy, in the commencement of the eleventh century. In the twelfth century the chronicles published by Innes, and those of Melrose and Holyrood, deserve to be noticed. About the year 1270 flourished Thomas of Er-

celdon,

SCOTLAND.

celson, commonly called Thomas the Rhymer, who wrote a metrical romance, called *Sir Triftram*, lately republished by Mr. Scott. The next writer of consequence is John Barbour, archdeacon of Aberdeen, who wrote a poem in commemoration of the heroic actions of Robert Bruce, in the year 1375, not less celebrated for its historical fidelity than for its poetical merit. About this time flourished John Fordun, designated the father of Scottish history. In the fifteenth century, James I. of Scotland wrote some poems of great merit, and he was succeeded by Holland, and Henry the Rhymer. Next arose Dunbar, whose merit has entitled him to be placed at the head of the ancient Scottish poets. In the beginning of the sixteenth century flourished Gawin Douglas, and sir David Lindsay. These were followed by many others of various merit, till the middle of the seventeenth century, when the unhappy events of that turbulent period checked the career of the arts and sciences. Before this, however, the illustrious Drummond had consigned to the world his exquisite poems. In modern times, the field of poetical merit has been more luxuriant. The names of Thomson, Ramsay, Blair, Armstrong, Beattie, Burns, Campbell, and Scott, with many others, are held in universal estimation.

In the other departments of science, though of later cultivation, the Scots have made rapid progress. In history, the names of Boethius and Buchanan are every where revered. The classic elegance and purity of the style of the latter, has entitled him to rank with the first authors of antiquity. In our own age, among other historians of great merit, have arisen Hume and Robertson, whose works will ever be read with enthusiastic delight by the admirers of taste and genius. In the mathematical department, lord Napier, the celebrated inventor of the logarithms; Maclaurin, no less celebrated for his astronomical works; and Dr. Simpson, noted for his knowledge of ancient geometry, have acquired a lasting reputation. In medicine, the names of Pitcairn, Monro, and Cullen, may be mentioned as holding the highest rank; and in the department of metaphysical and moral sciences she perhaps stands unrivalled. The labours of Hume, Hutcheson, Reid, Campbell, Beattie, Monboddo, Kaimes, Smith, and Ferguson, will be regarded with admiration, so long as the philosophy of the mind continues to be a subject of interest, and the English language is understood. Scotland has also attained the praise of superior excellence in other departments of science, particularly in political economy and in chemistry.

Universities.—The universities in Scotland are four in number; St. Andrews, Glasgow, Aberdeen, and Edinburgh. The first was founded by bishop Wardlaw, in 1412; the second by bishop Turnbull, in 1453; the third by bishop Elphinstone, in 1500; and the last by James VI. in 1580. As the reader will find each of them described under their respective names, we shall only observe farther concerning them in this place, that the university of Edinburgh is the most celebrated medical school in Europe, and is annually attended by from 1200 to 1500 students.

Education.—The mode of education adopted in this country is highly laudable, and is probably the best practicable system established in any kingdom. The plan followed in the cities and large towns is nearly similar to that of England; that is, by private seminaries and great public schools, of which the High School of Edinburgh is the most eminent. But the chief advantage of the Scottish education arises from the circumstance of every country parish having a schoolmaster, regularly appointed by the heritors, in the same way as the clergyman, who receives a small salary, which enables him to educate the children of the parishioners at a

rate easy and convenient even to the most indigent parents. In the Highlands, the children of the poor are occupied as herds during summer, and in winter attend schools. To be unable to read and write is considered so disgraceful in Scotland, that such persons are scarcely ever to be met with.

Manners and Customs.—In every part of the kingdom, but more especially throughout the Lowlands, the higher orders in Scotland are characterized by much the same features as in England. Their dress, their mode of living, and their amusements, both public and private, are nearly alike. The inferior orders in the Lowlands are likewise much assimilated to their southern neighbours in their style of dress, but their food and diversions materially differ. The ordinary diet of the Scottish peasant is *parich*, a composition of oatmeal and water, boiled together till it assumes a thick consistence. It is eaten with milk twice and sometimes thrice a day, and is seldom varied, except by *broafe*, which differs from *parich* only in having the addition of butter, and not being boiled. Butcher's meat is rarely eat, except on Sunday; but vegetable broths made with butter are not unfrequently used for dinner. Pork and eels were formerly held in great abhorrence, and even yet are regarded as impure articles of food, on account of superstitious opinions respecting them. In the Highlands these sentiments are particularly strong; and hence the rearing of swine is very little attended to in that district. In the same division of the kingdom, the national dress is still prevalent; but the tartan kilt has very generally given place to pantaloons of the same material. From the influence of education, and the well-directed exertions of the clergy, the peasantry have long been distinguished for sobriety, industry, and moral rectitude; and, in point of intelligence, are indubitably the first in the world. Even the artisans are entitled to share in this eulogy, though it must be confessed that exceptions to the rule are too numerous, especially in the great trading towns. The existence of witches, fairies, and ghosts, is still part of the creed of the Scottish peasant; and the Highlander confidently believes in the power of second sight, or the capability of perceiving future events. Some relics of the idolatrous worship of his remote ancestors are yet discernible, both in his amusements and his more serious occupations; but they are gradually becoming fainter, and will, no doubt, disappear in the progress of refinement and civilization. For information on the amusements, superstitions, and manners of the Scottish peasantry, the reader cannot consult any works with greater advantage than those two exquisite poems, the "Halloween," and "Cottar's Saturday Night," of the celebrated Burns. Referring, therefore, to them, we shall only further remark under this head, that in their religious ceremonies, considerable variations exist from the forms in England. Thus, for instance, in baptisms, godfathers and godmothers are inadmissible, the parents alone being made answerable for the education of their children in the path of morality and religion.

Antiquities.—Monuments of antiquity of every age, from the Celtic colonization of the kingdom, are yet visible in various districts. Those of the first epoch are all of the tumular kind, and are only to be discovered by nice investigation in the more wild and uncultivated tracts. Of the Roman period, the remains are numerous, consisting of vestiges of roads, stations, encampments, foundations of walls, and other minor antiquities. The celebrated wall of Antoninus may yet be traced, with perfect accuracy, nearly the whole of its extent from the Forth to the Clyde; and many interesting inscriptions are frequently dug up from its ruins. Near it was formerly a small edifice called Arthur's Oven, which the most intelligent antiquaries suppose to have been a temple

a temple dedicated to the god *Terminus*. The most northerly Roman camp yet discovered is situated on the river *Ythan*, in *Aberdeenshire*; and there are some roads extending into the county of *Angus*; but the chief remains of them are fouth of the walls. The monuments of the *Pictish* era consist of those circles of stones, cromlechs, &c. usually, but erroneously, denominated *Druidical* temples; and of those artificial mounds, or hills, whence the *Pictish* and *Dalriad* kings were wont to promulgate their laws. The most remarkable stone circles in the kingdom are those in the isle of *Lewis*, and on the Mainland of *Orkney*. The structures commonly called "*Picts' houses*," and the heaps of stones called "*cairns*," or "*karns*," have also been supposed to belong to this age; but *Pinkerton* refers the latter entirely to the *Dalriads*, or *Scots*, and thinks the former may be *Danish*, as it is certain similar edifices have been traced in *Scandinavia*. They seem to have consisted of a vast hall, open to the sky in the centre, and having recesses for beds, &c. in the wall. "These buildings," says the author last mentioned, "are remarkable, as displaying the first elements of the Gothic castle; and the castle of *Coningsburgh*, in *Yorkshire*, forms an easy transition." The remains of later ages are the sculptured obelisks at *Forres*, and other places; which are probably monuments of signal events, such as battles and treaties of peace; the noted vitrified forts, and churches, abbeys, and castles almost innumerable. Among the more remarkable buildings which owe their origin to religion, are the abbeys of *Melrose*, *Jedburgh*, and *Aberbrothick*; the cathedrals of *Dunkeld*, *Glasgow*, and *Brechin*; and the chapel of *Rosslyn*, near *Edinburgh*. The last is one of the most singular and interesting remains of ancient architecture in *Great Britain*; and *Melrose* abbey may vie with many in *England*, both as to the extent and magnificence of its buildings.

The following is a list of the books occasionally consulted during the compilation of this article. *Joannis de Fordun Scotichronicon, cum supplem. et contin. Walteri Boweri*; 2 vols. fol. *Edin.* 1759. *Scotia illustrata, &c. Auſt. Rob. Sibbald.* fol. 1684. The History of the Church of Scotland, from A.D. 203, to Death of James VI.; by John Spotwood; fol. *Lond.* 1655, 2d edit. 1677. *Georgii Buchanani Omnia Opera*; curante *Thoma Ruddimanno*; 2 vols. fol. *Edin.* 1715. This work contains his History of Scotland; a treatise *De Jure Regni apud Scotos*; another, entitled *Actio contra Mariam Scotorum Reginam*; and a third, entitled *Detectio Mariæ Reginæ Scotorum*; his letters, poems, and some pieces on language. Collection of Treatises, in folio, concerning Scotland, written by sir Robert Sibbald, *Edin.* 1707. This work comprises, among other pieces, Historical Inquiries concerning Roman Antiquities; Conjectures concerning the Roman Ports, Colonies, and Forts; and An Account of the Writers ancient and modern, which treat of the Description of Scotland. *Tractatus varii ad Scotiæ antiquæ et modernæ Historiam facientes, viz. Introductio ad Historiam Veteris Scotiæ, &c.; Specimen Glossarii; Commentarius in Julii Agricolæ Expeditiones, &c. in illustratione textus Taciti. Miscellanea quædam eruditæ Antiquitates quæ ad Borealem Britannicæ Majoris Partem pertinent. Vindiciæ Scotiæ illustratæ, &c.* An Account of the Scottish Atlas; or, the Description of Scotland, ancient and modern; fol. *Edin.* 1683. The Libertie and Independencie of the Kingdom and Church of Scotland asserted from ancient Records; by Robert Sibbald; 4to. *Edin.* 1703. *Selectus Diplomatum et Numismata Scotiæ Thesaurus, &c.; ab Jacobo Andersono.* Edited by *Thomas Ruddiman*; fol. *Edin.* 1739. History of the Affairs in Church and State in Scotland,

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SCOTLAND Neck, a town or rather village of America, in Halifax county, North Carolina, in which is a post-office; 250 miles S. of Washington.

SCOTLAND, *New*. See *Nova SCOTIA*.

SCOTLAND River, a river, or rather rivulet, in the island of Barbadoes, which rises in St. Andrew's parish, and falls into Long bay, on the E. side of the island, 4 miles S.S.E. of Cuckold's point, or $2\frac{1}{2}$ miles N.W. of St. Joseph's river, the only other small brook of the island.

SCOTODINOS, a term used by medical writers to express a vertigo, or dizziness of the head, attended with a dimness of sight.

SCOTOMIA, or SCOTOMA, a giddiness, or temporary confusion of sight; nearly synonymous with *vertigo*; which see.

SCOTS, in *Geography*, the name of one of the two great tribes,

tribes, into which the inhabitants of the northern region of Caledonia was divided, as early as the reign of Constantine; Picts being the denomination of the other. The name and almost the memory of the Picts have been extinguished by their successful rivals; and the Scots, after maintaining for ages the dignity of an independent kingdom, have multiplied, by an equal and voluntary union, as Gibbon expresses it, the honours of the English name. The hand of nature hath contributed to mark the ancient distinction of the Scots and Picts: the former were the men of the hills, and the latter those of the plain. The eastern coast of Caledonia was a level and fertile country, and produced, in a rude state of tillage, a considerable quantity of corn; so that the epithet of *cruinnich*, or wheat-eaters, expressed the contempt or envy of the carnivorous highlanders. Nevertheless, the love of arms and rapine was still the universal passion of the Picts; and their warriors, stripped for a day of battle, were distinguished, in the eyes of the Romans, by the strange fashion of painting their naked bodies with gaudy colours and fantastic figures. (See PICTS.) The western part of Caledonia irregularly rises into wild and barren hills, which scarcely repay the toil of the husbandmen, and are most profitably used for the pasture of cattle. Accordingly the highlanders were condemned to the occupations of shepherds and hunters; and as they were seldom fixed to any permanent habitation, they acquired the expressive name of *Scots*, which, in the Celtic tongue, is said to be equivalent to that of *wanderers* or *vagrants*. That the Irish descent of the Scots, though lately revived by Mr. Whitaker, is a fable, has been satisfactorily evinced by Mr. Gibbon; and he has traced the foundation upon which this fabulous superstructure has been gradually reared by the bards and the monks, two orders of men, who equally abused the privilege of fiction. It is *probable*, says this sagacious and elegant historian, that in some remote period of antiquity, the fertile plains of Ulster received a colony of hungry Scots; and that the strangers of the North, who had dared to encounter the arms of the legions, spread their conquests over the savage and unwarlike natives of a solitary island. It is *certain*, that in the declining age of the Roman empire, Caledonia, Ireland, and the Isle of Man, were inhabited by the Scots; and that the kindred tribes, who were often associated in military enterprises, were deeply affected by the various accidents of their mutual fortunes. They long cherished the lively tradition of their common name and origin; and the missionaries of the Isle of Saints, who diffused the light of Christianity over North Britain, established the vain opinion, that their Irish countrymen were the natural, as well as spiritual, fathers of the Scottish race. The Scottish nation, with mistaken pride, adopted their Irish genealogy; and the annals of a long line of imaginary kings have been adorned by the fancy of Boethius, and the classic elegance of Buchanan. Gibbon's Hist. vol. iv. See SCOTLAND.

Scots Tunes. In February 1722, the newspapers of the times inform us, that there was a concert for the benefit of Mr. Thomson, the first collector and publisher of Scots tunes in England. To this collection, for which there was a very large subscription, may be ascribed the subsequent favour of these national melodies south of the Tweed.

After this "concert, at the desire of several persons of quality, was performed a Scottish song."

In 1744, in the opera of "*Roselinda*," set by Veracini, at that time the leader of the opera band, the first air that presents itself, in the printed copy of the favourite songs, is "*The Lass of Patie's Mill*;" which Monticelli condescended to sing, and to which Veracini added parts and ritornelli, in order, as they imagined, to flatter the British

nation. But as few of the North Britons, or admirers of this national and natural music, frequent the opera, or mean to give half a guinea to hear a Scots tune, which perhaps their cook-maid, Peggy, can sing better than any foreigner, this expedient failed of its intended effect. See PALMA.

Scots, or *Scott*, in *Geography*, a county of Kentucky, containing 12,419 inhabitants. Its chief town is Georgetown, containing 529 inhabitants.

Scot's Bay, a bay on the S.W. coast of the island of Dominica, towards the S. extremity of the island; 4 miles S. of Charlotte-town.—Also, a bay of the North Pacific ocean, on the W. coast of America; 10 miles S. of Queen Charlotte's sound.

Scot's Cove, a bay on the S.W. coast of Jamaica.

Scot's Head, a cape at the southern extremity of Dominica. N. lat. 15° 20'. W. long. 61° 24'.

Scot's Islands, a cluster of islands in the North Pacific ocean, near the N.W. coast of the island of Quadra and Vancouver. N. lat. 50° 57'. E. long. 231° 2'.

SCOTT, JOHN, in *Biography*, a clergyman of the church of England, was born in 1638, at Chippenham, in Wiltshire. He was first apprenticed to a trade in London, which not being congenial to his taste, he quitted, and entered himself as a commoner of New Inn, Oxford. After receiving orders, he obtained a rectory in London, and a prebend in St. Paul's cathedral. In 1685 he took his degree of D.D.; and in 1691 he was appointed to the rectory of St. Giles-in-the-Fields, and was made canon of Windsor. "*The Christian Life*," which was published at different times, and finished in 1686, acquired for him so high a reputation, that, after the revolution, he was offered the bishopric of Chester; which, however, he refused, because he could not conscientiously take the oaths required. He was afterwards offered the bishopric of Worcester, and a prebend of Windsor, which he likewise declined, because they were the places of persons who had been deprived for an adherence to those principles, which he himself secretly cherished. Nevertheless he had strenuously opposed the progress of Popery in the reigns of Charles II. and James II., and published some works in controversy with the Papists, while the latter prince was still on the throne. Dr. Scott died in 1694, leaving the character of an excellent man and worthy parish-priest. Besides the work already mentioned, he wrote "*Cases of Conscience resolved*," concerning the Lawfulness of joining in Forms of Prayer in public Worship;" and "*Twelve Sermons*," preached on different occasions. His "*Christian Life*" is a book very generally read in the religious world.

SCOTT, MICHAEL, a celebrated Scotsman of the 13th century, was born at Balwearie, in Fife, about the beginning of the reign of Alexander II. At a very early period he made great progress in language, as well as the mathematics; and having finished his studies at home, he went over into France, where he remained some years; but hearing that the emperor Frederic II. was a great patron of learning and learned men, he repaired to the court of that prince, and applied himself closely to all the branches of philosophy then studied. After residing some time in Germany, he proceeded to England, and was high in the favour of Edward II.; but it is not at all known how long he continued here. Upon his return to Scotland he received the honour of knighthood from Alexander III., and was afterwards sent, with Michael de Wemys, to bring to Scotland the Maid of Norway, who, being taken ill at sea, was landed on one of the Orkney islands, where she died in the year 1290. At this time sir Michael was probably far advanced in life: he died in 1291. He was esteemed a man of

of great learning, though so much addicted to the occult sciences, that he passed among his contemporaries as a skilful magician. Boccaccio and Folengo both exhibit him as such; the former in one of his novels, and the latter in his macaronic poem; and he is introduced under the same character by Dante. It is not known where he was interred, but it seems generally admitted that his books of magic were either buried with him in his grave, or preserved in the convent where he died. A Latin translation of Aristotle's works is ascribed to sir Michael Scott, but probably upon insufficient evidence. There is a translation of that philosopher's works, partly from the Greek and partly from the Arabic, by various hands, undertaken at the command of the emperor Frederic II., at whose court sir Michael resided some time; and as he is reported to have translated Aristotle's Natural History of Animals from the Arabic version of Avicenna, it has been assumed that this is the only part of the work which should be ascribed to him. The title of the work is "Aristotelis Opera, Latine versa, partim e Græco partim Arabico, per viros lectos et in utriusque Linguae prolatione peritos, jussu Imperatoris Frederici II. Venet. 1496." The works of sir Michael Scott are numerous, among which the following may be mentioned: "Physiognomia et de Hominis Procreatione;" "De Secretis Naturæ;" "Questio curiosa de Natura Solis et Lunæ." The subject of this last work is the pretended transmutation of metals, gold and silver being reckoned among alchemists the sun and moon. According to the opinion of Riccioli, Scott was a diligent observer of the stars, and, at the request of the emperor Frederic II., he wrote a treatise on the sphere of Sacrobosco. Gen. Biog.

SCOTT, GEORGE LEWIS. This learned and accomplished man was not only an able mathematician, but an excellent musician. He was an intimate friend of Dr. Pepusch, and assisted him in drawing up his paper for the Royal Society, on the genera and systems of the ancient Greek music; and whatever articles he furnished to the Supplement of Chambers's Dictionary, concerning harmonics or the ratio of sounds, may be depended on. Mr. Scott was a performer on the harpsichord, and very fond of music; but always calculating, during his own performance and that of others, as to the legality of modulation. And we well remember his being much disturbed at the unrelative succession of chords, in the opening of Pergolese's "Stabat Mater," at the second bar, where that most pleasing author surprises the ear, as well as the eye and intellect, in modulating from F minor to Eb major. De Moivre, who had no taste or feeling for music, used to calculate ratios for the ingenious and worthy organist of the Charter-house, and laugh at him for his Greek and mathematical pretensions; but Scott, the sub-preceptor of his present majesty, was in earnest, and wished to make discoveries in Greek music, as much as Pepusch. For though attached to old masters of eminence, as well as the Carthusian maestro di cappella, he enjoyed the productions of the moderns extremely, when he could discover in them either genius or science.

As we had the honour to be personally acquainted with him, we are sure that the elaborate article *Temperament*, in music, in the additional volume to Chambers's Dictionary, was drawn up by the late learned and scientific Mr. Scott, who was one of the very few theorists that ever paid the least regard to *prædix*, or who seemed to recollect that the ear had any thing to do with harmonics.

SCOTTA, or SCOTTUS. See SCOT.

SCOTTI, TERESA, in *Biography*, the first woman in the operas of 1764 and 1765, in which Manoli sung.

The Scotti, with an elegant figure, a beautiful face, and

a feeble voice, sung in a very good taste; and though in want of power, she possessed great flexibility and expression.

SCOTTIA, in *Botany*, bears that name, as we presume, in memory of Robert Scott, M.D., late professor of Botany at Dublin, commemorated by Mr. Dawson Turner in the preface, as well as the dedication, of his *Muscologia Hibernica Spicilegium*.—Brown in Ait. Hort. Kew. v. 4. 268.—Class and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Jussl.

Eff. Ch. Calyx with five rather unequal teeth; its base clothed with imbricated appendages. Standard folded, shorter than the wings, which are the length of the keel. Stamens all connected. Legume stalked, compressed; thickened at each margin. Seeds few, crested.

1. *S. dentata*. Tooth-leaved Scottia.—Found by Mr. Brown on the south-west coast of New Holland. A shrub, sent to Kew garden, in 1803, by Mr. Peter Good. It is kept in the greenhouse, and flowers from June to September.

SCOTTSBURG, in *Geography*, a post-town of Virginia; 256 miles W. of Washington.

SCOTUSA, in *Ancient Geography*, a town of Macedonia, on the banks of the river Strymon, in the Odoman-tica, near Berga.—Also, a town of Greece, in Thessaly. Ptolemy.

SCOUR a Line, To, in the *Military Language*, is to flank it so as to see directly along it; that a musket-ball, entering at one end, may fly to the other, leaving no place of security.

SCOUR, among Cattle, a disease of the flux kind, which frequently affects cows, calves, sheep, and other animals. See SCOURING in Cows, and in Calves.

This is a disease in sheep, which is common in the winter season, being believed to originate from the severity of the frosts, especially when they set in suddenly, or alternate frequently with thaws. The chief dependence for a cure, in these cases, is upon an expeditious change to dry keep; as, in the practice of some good sheep-farmers, the use of hay, on the mornings when hoar-frosts are prevalent, has been found a good preventative. It is sometimes called the *gall* by sheep-farmers. Early, soft, tathy, luxuriant pastures, is also liable to produce this complaint, especially in previously worn-down sheep. It arises frequently, too, from sudden changes from dry, warm, poor pastures, to such as are rich, cold, and damp; or the contrary. It is sometimes likewise the consequence of other affections, as well as of the local weakness and relaxation of the bowels. In all these instances, the above changes of food will be highly useful and necessary. The disease may be stopped, except where it is critical, after clearing the intestines of any irritating matters, by mild purgatives, by the following means, particularly where there is great weakness of the affected parts. Boil four ounces of the shavings of logwood in two pints of water, until it be reduced to one pint; then add one ounce of cinnamon water, and give one half at a time. Where this is not strong enough to check the disorder, half a drachm of the extract of catechu may be dissolved in it, with fifty or more drops of the tincture of opium. These will mostly lessen the over-action of the bowels, and speedily remove the complaint. In mild cases of this nature, it will seldom be necessary to have recourse to the above remedy, as they will easily be removed by the use of water, in which a little calcined chalk and hartshorn shavings have been boiled. In high states of the disease, the strength of the medicine must be increased.

The *black scour* is, however, seldom capable of being retrained by any means that have yet been had recourse to; it therefore, for the most part, terminates fatally.

SCOUR, White, a disease in sheep of the more violent flux kind, supposed to originate in consequence of their feeding upon putrescent vegetable food, especially that of the shells of such turnips as have been left upon the feeding grounds. In these cases, it has been advised to give two or three large spoonfuls of the following mixture, every two or three days; the diseased sheep being separated from the rest of the flock. Take of finely powdered and sifted bay-salt, half a pound, and dissolve it in good old verjuice, one pint; to which add of good common gin half a pint; mixing the whole of them well together.

And in order to facilitate the removal of the disease, the sheep should be put upon good dry food, in an upland pasture. See SHEEP.

SCOURING in Cows, a disease in these animals of the flux kind, in which there are frequent liquid dejections from the intestines, proceeding from irritation, the excrements, according to Downing, being slimy, bilious, or black; sometimes they are limpid and fluid, like water cast out; at other times they are frothy, greasy, and mixed with a fat clayish coloured substance. This disorder is generally attended with a bad appetite, a weak depressed pulse, harsh dry skin, dull countenance, and something of a slow fever. This disease is so obvious, that it needs no further description; for the copious evacuation of the excrements, and many other signs, make it evident to the knowledge of every person. And he supposes, that the first stage of it is a companion of the *joint yellows*, and may be traced out to the satisfaction of any one who will take the trouble to open any animal that dies of this disorder.

According to others it affects oxen as well as cows, and arises from want of sufficient food, both in quality and proportion; from being overheated or overworked; by feeding on wet unwholesome fog or after-grass; by not being lodged in dry situations; sometimes from giving them too large a quantity of cut hay or straw, hotter than their natural temperature; though it is sometimes a constitutional taint, and in cows is caused by their taking cold while calving. But whatever be the cause, as soon as it begins to appear it will be necessary to house the beast, and put it to dry food, which, in early stages of the disease, often effects a cure. But in this case Mr. Downing advises the following:

Take of mutton suet, one pound; oil of turpentine, four ounces; boil these together in three quarts of milk till the suet is dissolved, and give it at night milk-warm; and the next morning give the following medicine:

Take pomegranate powder, eight ounces; logwood in powder, two ounces; new pipes pounded, two ounces; Peruvian bark in powder, two ounces; roch alum in powder, six ounces: mix them together, to be given in two quarts of old ale or urine, and repeated every other day. The beast should fast two hours before and two after taking the medicine. He afterwards has recourse to crab verjuice, in the quantity of a pint, for several mornings. And also the following. Take calcined oyster-shells in powder, four ounces; ditto pipe-clay, one ounce; oak-bark powder, two ounces; grains of paradise, one ounce; roch alum, one ounce. Mix these together for one dose, to be given in a quart of old beer and a pint of red wine, or in three pints of oak-dip from the tan-pits.

But others advise half a pound of grossly pulverized tormentil root, to be boiled in two quarts of water till reduced to one quart, then straining it off, and adding a

quart of red wine, a quarter of a pound of finely powdered chalk or whiting, and two ounces of diascordium, without honey. The mixture should be preserved in a bottle, and occasionally well shaken together, making it lukewarm before it is given. The dose is half a pint, given three times in the day, at equidistant periods. Or half a pound of pulverized common chalk may be boiled in two quarts of water, till diminished to three pints, then adding four ounces of hartshorn shavings, and one ounce of cassia, stirring the whole carefully. When cold, two drachms of tincture of opium, and one pint of lime-water, may be added; the whole being kept closely stopped in a bottle, and well shaken before it is used: the dose is one or two horns-ful in the day.

SCOURING in Calves, a disease to which they are very subject at an early period, being often caused by improper management in putting them too soon to the teat, or letting them remain too long at it. It is also sometimes caused by too frequently changing the milk.

But in order to effect a cure, it has been advised to restrict the calf in the quantity of its food, giving a hard boiled egg, made fine by chopping, in a drench, the first thing in the morning. Chalk powdered and mixed up with flour into balls with gin has also been recommended as useful and safe in these cases, by a writer in the *Annals of Agriculture*.

In Essex, some farmers have found the following remedy almost infallible. Two tea-spoonfuls of rhubarb in fine powder, and a table-spoonful of peppermint water, kneaded well together. If once giving of this does not stop the complaint, a second dose is given, with a little red port wine added to it, which mostly completes the cure. In one case an apparently dying calf was restored by the use of this medicine.

Powdered chalk given in their troughs, with the barley meal for fattening them, is found to have a good effect in this intention, as well as in other ways.

And a decoction of calcined chalk, hartshorn shavings, and a little coarsely pounded cassia, with a very small quantity of the tincture of opium, will mostly be found of great benefit in cases of this nature, when given to the extent of from two or three to five or six table-spoonfuls once or twice in the course of the day.

SCOURING in Lambs, &c. a disease which is common to them in many places, but especially to those which have been sent to winter on the hills from the Romney-marsh lands in the southern part of the kingdom. Those also which continue in the Marsh during the same season, are liable to be attacked with the complaint on the approach of spring. Sheep which are weakened in their constitutions, and have experienced a quick transition from poor, low, to rich, full keep, are the most subject to be affected. Likewise when they are first brought upon the marsh-lands in the early spring, particularly when moist warm weather succeeds to keen frosts, though it often shews itself at other times of the year, as already noticed. The writer of the Romney-marsh sheep-grazing system remarks, that the farmers there consider it salutary, and believe that the sheep fatten more quickly after it: but he suggests, that when it is long continued, the powers of their systems must be greatly injured and reduced. In such cases, the disorder ought mostly to be restrained and removed by having recourse to dry food, and the use of suitable remedies. The above writer has had twenty lambs attacked with it in a season, and not being able to learn them to eat hay, succeeded in saving most of them, by means of giving them an astringent cordial drink, with a small portion of opium, and turning

turning them upon dry, found, old, artificial pasture-land. But three of the number, to which suet boiled in milk had been given, all died. Tar mixed with the finely powdered lime of an old wall, and formed into suitable balls, is said, in some instances, to prove an effectual remedy for this complaint.

On the whole it is thought, that as the disorder evidently arises either from cold, moisture, and poor food, or from weakly sheep being suddenly put upon too rich keep, the most proper and rational method of removing the affection is, in the first circumstances, to turn the sheep immediately into a new warm pasture, and supply them well with fresh good hay, &c.; and in the latter case, to put them upon found old sward land. In support of this practice, a sheep farmer in the same neighbourhood asserts, that he constantly keeps his wether lambs on or near to the above Marsh, and that he never has any of his flock affected with the disease; which he imputes to the allowing of them old grass upon the land. The grounds are warm, and well sheltered by trees and fences.

SCOURING, *Preventative Remedies, for Horses*, such as are given to work and other horses, as well as occasionally to other sorts of live-stock, for the purpose of preventing the occurrence of disease in them. The incautious and indiscriminate use of remedies of this nature among horses and other cattle has been the cause of much loss and mischief. Animals by no means stand so frequently in need of medicines of this sort as has been supposed, though they may sometimes have occasion for them. The state and circumstances of the animals, with a full knowledge of the manner in which they have been kept, and the labour or exercise which they have had, will, with due discrimination and judgment in the person who has the care of them, mostly best point out when they may be necessary and useful; and when, on the contrary, improper and hurtful. Calomel and aloes are probably the most proper substances to be generally employed in this way, though others of the purging kinds may sometimes be joined with them to promote their operation with much advantage and effect. However, from the natural motion of the bowels of horses being slow, and the length of the intestinal canals great, unless the stimulant purgative power of the substance continues for some time after it has passed from the stomach, no effect will be produced upon them. This accounts for the failure of such remedies in many cases. Yet on the same grounds, it may naturally be supposed, that a powerful dose of such medicines may increase this action in such a manner, and propel the contents of the bowels in so forcible a degree, as to produce great pain, inflammation, or other mischief, which may either kill the animal or greatly injure it, as is frequently exemplified.

Consequently, in every case where the strength and the state of the animal are not well known, the best method may be to begin with giving not too large doses of remedies of this nature, but increasing them afterwards where found necessary. In this way there will be every advantage secured, without the danger of injury being done.

Such horses as are newly taken up into warm stables from cold exposed situations, will often stand in need of one or two gentle doses of this kind. But horses employed in team labour, or hard work of other sorts, will very seldom require such assistance. It may, however, be occasionally useful. Swellings of the legs, inflammations of the eyes, coughs, and colds, arising from the sudden change of temperature, may in many cases be prevented, by rendering the stables more open and airy on the horses being first taken up into them, especially if they be close and warm,

Strong young horses mostly require a few doses on their first coming into the stable, but by no means so many as are usually given. Horses too, after being long soiled on green food, sometimes are the better for such remedies. Also such as have swelled and cracked heels from high feeding and too much inaction. There may be some other cases in which such remedies are beneficial, but they are only few, as it is not at all necessary to have recourse to them in that general way which is commonly imagined.

The most usual, and probably the best mode of giving such remedies, is that of letting the animal have the calomel balls in the evening, and those of the aloes kind in the morning, so as to work them off in some measure.

From one drachm to two drachms, in proportion to the strength of the animal, of the first or calomel, with half an ounce of some aromatic powder, made up with treacle or honey, will form a proper ball for the evening dose. And from half an ounce to one ounce, according to the state of the animal, of finely powdered Barbadoes aloes, with two drachms of powdered ginger, made up in the same way, will form a suitable morning ball in this intention.

Proper mashes and feeds, with suitable work or exercise, and grooming, are to be had recourse to at the same time. The space of eight or ten days should always elapse before the doses are repeated.

SCOURINGS, among *Farriers*, such gentle purges as preserve horses from noxious humours.

SCOUTS, in *Military Language*, are generally horsemen sent out before, and on the wings of an army, at the distance of a mile or two, to discover the enemy, and give the general an account of what they observe.

SCOUZIE HEAD, in *Geography*, a cape of Scotland, on the E. coast of the county of Caithness; 3 miles S. of Duncansby Head. N. lat. $58^{\circ} 31'$. W. long. $2^{\circ} 25'$.

SCOW, in *Agriculture*, a term used by farmers to signify the sheath of a horse.

SCOWBEGAN FALLS, in *Geography*, falls which boats cannot pass, in the Kennebeck river, in the state of Maine, North America, near the town of Canaan.

SCRABY, or **SCRABA**, a small post and fair-town of the county of Cavan, Ireland, near Lough Gawnah; 60 miles N.W. from Dublin, and 7 N.W. by W. from Granard.

SCRAPER, an instrument used in mezzotinto engraving, formed much in the manner of a knife, except that the edge is straight till near the point, and there slopes off at an angle from both sides; the lines of which slopes meeting form another angle of the point; but the slope on one side is much longer than that of the other.

SCRAPING in *Mezzotinto*. See **MEZZOTINTO**.

SCRAPING, in *Naval Language*, is the act of shaving off the dirty surface of the plank, in a ship's side or decks, particularly after a voyage, or when the seams have been covered with a new composition of melted pitch or rosin. The instrument with which this is performed is called a scraper.

SCRATCH, in the language of the salt-workers of our country, the name of a calcareous, earthy, or stony substance, which separates from sea-water in boiling it for salt.

This forms a thick crust in a few days on the sides and bottoms of the pans, which they are forced to be at the pains of taking off once in a week or ten days, otherwise the pans burn away and are destroyed. (See **SALT**.) This is no other than the same substance which crusts over the insides of our tea-kettles, and is truly a spar, sustained more or less in all water, and separable from it by boiling.

boiling. The shells of sea-fish have great affinity in their substance and nature with this, both being powerful alkalies, and both easily calcining into lime.

The *magnesia alba*, so celebrated in Germany for its mild purgative and alkaline virtues, seems very nearly allied to this earth; and it is probable, according to Hoffmann, that the purging virtues of many springs are owing to the quantities they contain of this substance.

SCRATCHES, among *Farriers*, a distemper incident to horses, consisting of dry scabs, chops, or rifts, that breed between the heel and the paltern joint.

There are various kinds of scratches, distinguished by various names, as crepances, rat-tails, mules, kibes, pains, &c. which are all for many species of the same malady, engendered from some hot humours falling on the legs, or from the fumes of the beast's own dung lying under his heels, or near them, or for want of rubbing his heels, especially after a journey, from over-hard riding, &c.

The disorder begins first with dry scabs in the paltern joint, in several forms. It is known by the staring, dividing, and curling of the hair on the part. For the cure of this disorder, see **GREASE**.

In order to prevent it, the heels should be kept supple with curriers' dubbing, which is made of oil and tallow: by using this precaution before exercise, and washing the heels with warm water when the horse comes in, the scratches will be prevented.

SCRATCH-PANS, in the English *Salt-Works*, a name given to certain leaden-pans, which are usually made about a foot and a half long, a foot broad, and three inches deep, and have a bow, or circular angle of iron, by which they may be drawn out with a hook, when the liquor in the pan is boiling. See **SALT**.

The use of these pans is to receive the scratch; and these pans being placed at the corners of the salt-pan, where the heat is least violent, catch it as it subsides there.

SCRATCH-WORK, *SGRAFFIATA*, a way of painting in fresco, by preparing a black ground, on which is laid a white plaster; which white being taken off with an iron bodkin, the black appears through the holes, and serves for shadows.

This kind of work is lasting; but being very rough, it is unpleasant to the sight. It is chiefly used to embellish the fronts of palaces, and other magnificent buildings.

SCRAWLY, in *Agriculture*, a term provincially signifying thin and ravell'd as grain.

SCREAMER, in *Ornithology*. See **PALAMADEA**.

SCREEN, an instrument for keeping off the wind, or the heat of the fire.

SCREEN is also used for a frame of laths to sift earth, sand, gravel, &c.

SCREEN, or *Screen-Machine*, in *Agriculture*, a simple contrivance, invented for the purpose of clearing grain of different kinds, of various injurious sorts of seeds, by passing it through it. It consists of a wooden frame, which has ledges on the sides, with a sort of hopper in the upper part of it, to which is attached a kind of valve, that moves to suitable distances by means of a screw, for letting proper quantities of grain pass down upon a square wire sieve, which is fixed below in the frame, and communicates with the hopper in some measure. The screen stands up in a sloping position by means of a leg, that draws out behind it, and which is commonly regulated by a cord, while the operation of screening or clearing the grain is going on. It is a very useful and convenient machine on small arable farms, but on large ones the work is now usually done by a somewhat similar contrivance in the threshing ma-

chine, while that is going on with it. See **THRESHING Machine**.

SCREEN-Fences, such fences as are raised for the purpose of affording shelter from winds, storms, &c. The writer of the tract on improving landed estates suggests, that for the purpose of shelter to pasturing stock, a tall impervious fence is nearly equal to a depth of coppice-wood, and infinitely preferable to an open grove of timber-trees; besides its additional use as a fence, or means of inclosure. And that there appears to him to be only one kind of fence which is properly adapted to this purpose, which is that of the coppice mound hedge of Devonshire and South Wales; and which consists in a high wide bank or mound of earth, planted with coppice-woods. This becomes, immediately on its erection, a shelter, and a guard to pasture-grounds round which it is formed.

And in respect to the method of forming fences with this intention, it is that of carrying up long piles of earth, between two sod-facings, battering, or leaning somewhat inward, to the required height; and planting on the top the roots and lower stems of coppice-plants, gathered in woods or on waste grounds, or with nursery plants adapted to the given situation. If the mound be carried to a full height, as five or six feet, and about that width at the top, and this be planted with strong plants, with stems cut off about two feet above the roots (in the usual practice of Devonshire), a sufficient fence is thus immediately formed against ordinary stock; but if the bank be lower, or if nursery plants be put in, a slight guard run along the outer brink, on either side, and leaning outward over the face of the mound, is, he observes, required (especially against sheep), until the plants get up. But where a hedge of this kind is raised as a plantation-fence, (especially on the lower side of a slope,) the outer side only requires to be faced with sods; the hedge-plants being set in a rough shelving bank, on the inner side of the fence.

Further, with respect to the species of hedge-woods proper for mound fences, they depend entirely, he thinks, on the soil and situation. On mounds of bad soil, in a bleak situation, he has seen the furze alone affording much shelter, and a good fence. The sides being kept pruned, so as to shew a close firm face rising above the top of the bank, it was a secure barrier, even against the wilder breeds of Welsh sheep. The beech is commonly planted in high exposed situations; and in places more genial to the growth of wood, the hazel, the ash, and the oak are the ordinary plants of hedge mounds. The willow tribe have a quality which recommends them in situations where they will flourish; they grow freely from cuttings, or truncheons set in the ground; whereas to secure the growth of ordinary coppice-woods, rooted plants are required. The fallow (*Salix caprea*) will grow in high and dry situations, in a manner so as to be useful in this sort of business. And it may be further noticed in regard to this description of fences, that on thin soiled stony surfaces, tall mounds are difficult to raise; and, there, stone walls are not only built at a small expence, but are convenient receptacles for the stones with which the soil is encumbered. But a stone wall, unless it be carried up to an inordinate height, at a great expence, is, he conceives, useless as a screen-fence, and is said to be dangerous as such in a bleak, exposed situation; for as soon as the drifting snow has reached the top of the wall, on the windward side, it pours over it, and inevitably buries the sheep which may be seeking for shelter, on the leeward side. It is therefore conceived, that it is necessary that a stone fence should be backed with a screen-plantation, in order to render it more safe and effectual for the purpose.

It may be remarked, that these sorts of screen-fences should be more attended to by the proprietors of land in all exposed situations, as they have much effect in promoting the improvement of different sorts of live-stock in such exposures.

SCREEN-Plantations, and Planting, a term sometimes applied to such belts, clumps, or hedges, as are planted with a view of affording shelter in exposed situations. And Mr. Marshall, in his work on "Landed Property," considers the effect of such plantations, not merely that of giving shelter to the animals lodging immediately beneath them; but likewise in breaking the uniform current of the wind; shattering the cutting blasts, and throwing them into eddies; thus meliorating the air to some distance from them. And, moreover, he is of opinion, that living trees communicate a degree of actual warmth to the air which envelopes them. It is at least, he thinks, a probable truth, that where there is life there is warmth, not only in animal but in vegetable nature. The severest frost rarely affects the sap of trees; it consequently appears to him, that trees and shrubs, properly disposed in a bleak situation, tend to improve the lands so situated in a threefold way for the purposes of agriculture: namely, by giving shelter to stock, by breaking the currents of winds, and by communicating a degree of warmth or softness to the air in calmer weather, or when the seasons are more mild.

Besides, it is suggested that the proper disposal of screens in this intention, is in lines across the most offensive winds, and in situations best calculated to break their force. Placed across vallies, dips, or more open plains in bleak exposures, they may, he supposes, be of singular use; and also on the ridges, as well as on the points and hangs of hills, and other elevated places.

And in regard to the *width* of such screens, they ought generally, he thinks, to be regulated by the value of the land for agricultural uses, and the advantages of the situation for the sale and delivery of timber. In ordinary cases, it is conceived that from two to four statute poles may mostly be considered as an eligible width for such purposes. With respect to the nature or species of plants which are most suitable, they must constantly be adapted to the given soil and situation. Mr. Marshall thinks, that in bleak and barren situations the larch will generally be found the most profitable as timber. But being deciduous, it does not in winter afford so much shelter as the common fir. A screen to shelter live-stock should be close at the bottom: it is otherwise injurious rather than beneficial. Not only the blast acquires additional current, but snow is liable to be blown through, and to be lodged in drifts on the leeward side, to the annoyance and danger of sheep that have repaired to it for shelter. A larch plantation margined with firs, and these headed at twelve or fifteen feet high, would, he supposes, afford the required shelter for a length of years. The firs, thus treated, would be induced to throw out lateral boughs and feather to the ground; while the larches, in their more advanced state of growth, would, by permitting the winter's winds to pass through the upper part of the screen, break the current and mellow the blast, and in this way a complete shelter be provided; but in other more genial situations, the beech, by retaining its leaves in winter, especially while it is young, forms a valuable screen. And that, if the outer margins were kept in a state of coppice-wood, and cut alternately, and the middle ranks suffered to rise as timber-trees, the triple purpose of screen-plantations might, he imagines, be had in an eminent degree, and almost in perpetuity, with but little trouble. And in deep-soiled, vale districts, which not unfrequently want shelter, screens of oak might, he conceives, be managed in a similar way: and

hollies, or other hardy evergreens, planted as underwood in groves of either of the above descriptions, would, if suitable situations were assigned to them, he supposes, assist much in this intention, especially where proper care was taken in planting and protecting them.

This sort of plantation, when first formed, should always be well suited to the nature of the exposure, both in respect to the kinds of the trees and plants which are made use of for the purpose, and the space or extent of the planting which will be necessary for effecting the business. In common, narrow slips never answer the intention in any perfect manner, as the trees neither rise well, nor afford the shelter which is wanted in such cases. See *SHELTER*.

SCREEN-Bulkhead, in *Ship-Building*, the after-bulkhead under the round-house, when the ship has a walk, or balcony.

SCREW, or *SCRUB*, *Cochlea*, in *Mechanics*, one of the six mechanical powers; chiefly used in pressing or squeezing bodies close, though sometimes also in raising weights. See *MECHANICAL Powers*.

The screw is a right cylinder, as *A B* (*Plate XXXVIII. Mechanics*, *fig. 1.*) furrowed spiral-wise; it is generated by the equable motion of a right line *F G* (*fig. 2.*) around the surface of a cylinder; while, at the same time, the point *I* descends equably from *F* towards *G*. Or, it may be conceived to be made by cutting a piece of paper into the form of an inclined plane, or half-wedge, and then coiling it round a cylinder; so that its action depends on the same principles as that of an inclined plane. The force tending to turn the screw round its axis may be considered as applied horizontally to the base of the wedge, and the weight which is to be raised as acting vertically on its inclined surface: the circumference of the cylinder will represent the horizontal length of the wedge; and the distance between the threads, measured in the direction of the axis, will be its height, provided that the threads be single; consequently, the forces required for the equilibrium are to each other, as the height of one spire to the circumference of the screw. But besides these forces, it is necessary that some obstacle be present, which may prevent the body, on which the screw acts, from following it in its motion round its axis; otherwise there can be no equilibrium. If the furrowed surface be convex, the screw is said to be *male*; if concave, it is *female*.

Where motion is to be generated, the male and female screw are always joined; that is, whenever the screw is to be used as a simple engine, or mechanical power; and when thus fitted together, they are sometimes called a screw and a nut. The nut acts on the screw with the same mechanical power as a single point would do, since it only divides the pressure among the different parts of the spire. When joined with an axis in peritrochio, there is no occasion for a female; but in that case it becomes part of a compound engine.

The screw cannot properly be called a simple machine, because it is never used without the application of a lever, or winch, to assist in turning it. Sometimes the spires of a screw are made to act on the teeth of a wheel, when a very slow motion of the wheel, or a very rapid motion of the screw, is required for the purposes of the machine.

SCREW, Doctrine of the. 1. If, as the compass, described by the power in one turn of the screw, is to the interval or distance between any two immediate threads, or spiral windings, as *B I* (measured according to the length of the screw), so is the weight or resistance to the power; then the power and the resistance will be equivalent one to the other; and, consequently, the power being increased, so as to counteract the friction of the screw, which is very considerable, will overcome the resistance. For it is evident, that in one turn

SCREW.

of the screw, the weight is so much lifted up, or the resistance so much moved, or the thing to be pressed is squeezed so much closer together, as is the distance between two immediate spirals; and in the same time, the power is so much moved, as is the compass described by the said power in one turn of the screw. Wherefore the velocity of the weight (or whatsoever answers thereto) will be to the velocity of the power, as is the said distance between the spirals to the compass described by the power, in one revolution or turning round of the screw; so that the gaining in power is here recompensed by the loss in time.

2. As the distance between two threads, B I, is less; the power required to overcome the said resistance is less; therefore the finer the thread, the easier the motion.

3. If the male screw be turned in the female, at rest, a less power will be required to overcome the resistance, as the lever or scytala C D (*fig. 3.*) is the longer.

4. The distance of the power from the centre of the screw, C D, the distance of the two threads I K, and the power to be applied in D, being given, to determine the resistance it will overcome: or, the resistance being given, to find the power necessary to overcome it.

Find the periphery of a circle described by the radius C D; then to the distance between the two threads, the periphery just found, and the given power; or, to the periphery found, the distance of the two threads I K, and the given resistance, find a fourth proportional. This, in the former case, will be the resistance that will be overcome by the given power; and, in the latter, the power necessary to overcome the resistance.

E. gr. Suppose the distance between the two threads, 3, the distance of the power from the centre of the screw C D, 25, and the power 30 pounds; the periphery of the circle to be described by the power, will be found 157. Therefore, as $3 : 157 :: 30 : 1570$, the weight to which the resistance is equal.

5. The resistance to be overcome by a given power being given; to determine the diameter of the screw, the distance of the two threads I K, and the length of the scytala, or handle: the distance of the threads, and the diameter of the screw, may be assumed at pleasure, if the male be to be turned in the female by a handle. Then, as the given power is to the resistance it is to overcome, so is the distance of the threads to a fourth number, which will be the periphery to be described by the handle C D; in a turn of the screw. The semidiameter of this periphery, therefore, being sought, we have the length of the handle C D. But if the female screw be to be turned about the male, without any handle, then the periphery and semidiameter found will be very nearly those of the screw required.

E. gr. Suppose the weight 6000, the power 100, and the distance of the threads 2 lines; for the periphery to be passed over by the power, say $100 : 6000 :: 2 : 120$; the semidiameter of which periphery being $\frac{1}{2}$ of 120 = 40 lines, will be the length of the handle, if any be used; otherwise the side of the female screw must be 40 lines. Mr. Hunter has described a new method of applying the screw with advantage in particular cases. *Phil. Trans.* vol. lxxi. part i. p. 58, &c.

A cylindrical screw is bored, and made at the same time a tubular screw, with a little difference in the distances of the threads, so that when it is turned within a fixed nut, it rises or sinks a little more or less than the internal screw, which perforates it, would rise or sink by the action of its own threads; and a weight attached to this internal screw ascends, in each revolution, only through a space equal to the difference of the height of the two coils. Here the

machine is analogous to a very thin wedge, of which the thickness is only equal to the difference of the distances of the threads, and which of course acts with a great mechanical advantage. It might, in some cases, be more convenient to make two cylindrical screws of different kinds, at different parts of the same axis, rather than to perforate it. The friction of such machines is, however, a great impediment to their operation.

SCREW, Endless. If a screw be so fitted as to turn a dented wheel D F (*fig. 4.*) it is called an *endless*, or *perpetual screw*, because it may be turned for ever, without coming at an end. From the scheme, it is evident enough, that while the screw turns once round, the wheel only advances the distance of one tooth.

SCREW, Doctrine of the Endless. 1. If the power applied to the lever, or handle of an endless screw A B, be to the weight, in a ratio compounded of the periphery of the axis of the wheel E H, to the periphery described by the power in turning the handle, and of the revolutions of the wheel D F, to the revolutions of the screw C B, the power will be equivalent to the weight.

Hence, 1. As the motion of the wheel is exceedingly slow, a small power may raise a vast weight, by means of an endless screw; for this reason, the great use of the endless screw is, either where a great weight is to be raised through a little space; or, where a very slow gentle motion is required. On which account it is very useful in clocks and watches.

2. The number of teeth, the distance of the power from the centre of the screw A B, the radius of the axis H E, and the power, being given; to find the weight it will raise.

Multiply the distance of the power from the centre of the screw A B, into the number of teeth: the product is the space of the power passed through, in the time the weight passes through a space equal to the periphery of the axis. Find a fourth proportional to the radius of the axis, the space of the power now found, and the power. This will be the weight which the power is able to sustain. Thus, if $A B = 3$, the radius of the axis H E = 1; the power 100 pounds, number of teeth of the wheel D F 48; the weight will be found 14,400; whence it appears, that the endless screw exceeds all others in increasing the force of a power.

A machine for shewing the power of the screw, may be contrived in the following manner. Let the wheel C (*fig. 5.*) have a screw *a b* on its axis, working in the teeth of the wheel D, which we may suppose to be forty-eight in number. It is plain, that for every revolution of the wheel C, and screw *a b*, by the winch A, the wheel D will be moved one tooth by the screw; and, therefore, in forty-eight revolutions of the winch, the wheel D will be once turned round. Then, if the circumference of a circle, described by the handle of the winch, be equal to the circumference of a groove *e* round the wheel D, the velocity of the handle will be forty-eight times as great as the velocity of any given point in the groove. Consequently, if a line G goes round the groove *e*, and has a weight of forty-eight pounds hung to it below the pedestal E F, a power equal to one pound at the handle will balance and support the weight. To prove this by experiment, let the circumferences of the grooves of the wheels C and D be equal to one another; and then, if a weight H of one pound be suspended by a line going round the groove of the wheel C, it will balance a weight of forty-eight pounds hanging by the line G; and a small addition to the weight H will cause it to descend, and so raise up the other weight. If the line G, instead of going round the groove

groove *e* of the wheel D, goes round its axle I, the power of the machine will be as much increased, as the circumference of the groove *e* exceeds the circumference of the axle; and if we suppose it to be six times, then one pound at H will balance six times 48, or 288 pounds hung to the line on the axle; and hence the power or advantage of this machine will be as 288 to 1; *i. e.* a man, who by his natural strength could lift a hundred weight, will be able to raise 288 hundred, or 14 $\frac{3}{4}$ ton weight by this engine. Ferguson's Mech. edit. 4to. p. 44.

SCREW, *Archimedes's*, or the *spiral pump*, or as it is called in Germany, the *water snail*, is a machine for the raising of water, first invented by Archimedes.

Its structure and use will be understood by the following description of it. A B C D (*Plate XIV. Hydraulics, fig. 11.*) is a wheel, which is turned round, according to the order of the letters, by the fall of water E F, which need not be more than three feet. The axle G of the wheel is elevated so as to make an angle of about 44°, or between 45° and 60°, with the horizon; and on the top of that axle is a wheel H, which turns such another wheel I of the same number of teeth; the axle K of this last wheel being parallel to the axle G of the two former wheels. The axle G is cut into a double-threaded screw (as in *fig. 12.*), exactly resembling the screw on the axis of the fly of a common jack, which must be what is called a right-handed screw, like the wood screws, if the first wheel turns in the direction A B C D; but it must be a left-handed screw, if the stream turns the wheel the contrary way; and the screw on the axle G must be cut in a contrary way to that on the axle K, because these axles turn in contrary directions. These screws must be covered close over with boards, like those of a cylindrical cask; and then they will be spiral tubes. Or, they may be made of tubes of stiff leather, and wrapt round the axles in shallow grooves cut therein, as in *fig. 13.* The lower end of the axle G turns constantly in the stream that turns the wheel, and the lower ends of the spiral tubes are open into the water. So that, as the wheel and axle are turned round, the water rises in the spiral tubes, and runs out at L through the holes M, N, as they come about below the axle. These holes, of which there may be any number, as four or six, are in a broad close ring on the top of the axle, into which ring the water is delivered from the upper open ends of the screw tubes, and falls into the open box N. The lower end of the axle K turns on a gudgeon, in the water in N; and the spiral tubes in that axle take up the water from N, and deliver it into another such box under the top of K; on which there may be such another wheel as I, to turn a third axle by such a wheel upon it. And in this manner water may be raised to any given height, where there is a stream sufficient for that purpose to act on the broad float-boards of the first wheel. Ferguson's Mechanics, Supplement, p. 22.

An instrument of a similar nature is called by the Germans a water screw; it consists of a cylinder with its spiral projections detached from the external cylinder or coating, within which it revolves. This machine might not improperly be considered as a pump, but its operation is precisely similar to that of the screw of Archimedes. It is evident that some loss must here be occasioned by the want of perfect contact between the screw and its cover; in general, at least one-third of the water runs back, and the machine cannot be placed at a greater elevation than 30°; it is also very easily clogged by accidental impurities of the water; yet it has been found to raise more water than the screw of Archimedes, when the lower ends of both are immersed to a considerable depth; so that if the height of the surface of the

water to be raised were liable to any great variations, the water screw might be preferable to the screw of Archimedes. *Plate XIV. Hydraulics, fig. 14.*

When a spiral pipe, consisting of many convolutions, arranged either in a single plane, or in a cylindrical or conical surface, and revolving round a horizontal axis, is connected at one end by a water-tight joint with an ascending pipe, while the other end receives during each revolution nearly equal quantities of air and water, the machine is called a spiral pump. It was invented about 1746, by Andrew Wirtz, a pewterer at Zurich, and it is said to have been used with great success at Florence and in Russia: it has also been employed in this country by lord Stanhope; and I have made trial of it (says Dr. Young) for raising water to a height of forty feet. The end of the pipe is furnished with a spoon, containing as much water as will fill half a coil, which enters the pipe a little before the spoon has arrived at its highest situation, the other half remaining full of air, which communicates the pressure of the column of water to the preceding portion, and in this manner the effect of nearly all the water in the wheel is united, and becomes equivalent to that of the column of water, or of water mixed with air, in the ascending pipe. The air nearest the joint is compressed into a space much smaller than that which it occupied at its entrance, so that where the height is considerable, it becomes advisable to admit a larger portion of air than would naturally fill half the coil, and this lessens the quantity of water raised, but it lessens also the force required to turn the machine. The joint ought to be conical, in order that it may be tightened when it becomes loose, and the pressure ought to be removed from it as much as possible. The loss of power, supposing the machine well constructed, arises only from the friction of the water on the pipe, and the friction of the wheel on its axis; and where a large quantity of water is to be raised to a moderate height, both of these resistances may be rendered inconsiderable. But when the height is very great, the length of the spiral must be much increased, so that the weight of the pipe becomes extremely cumbersome, and causes a great friction on the axis, as well as a strain on the machinery: thus, for a height of 40 feet, Dr. Young found that the wheel required above 100 feet of a pipe which was three quarters of an inch in diameter; and more than one half of the pipe being always full of water, we have to overcome the friction of about 80 feet of such a pipe, which will require 24 times as much excess of pressure to produce a given velocity, as if there were no friction. The centrifugal force of the water in the wheel would also materially impede its ascent if the velocity were considerable, since it would be always possible to turn it so rapidly as to throw the whole water back into the spoon. The machine which Dr. Young had erected being out of repair, he thought it more eligible to substitute for it a common forcing pump, than to attempt to make any further improvement in it, under circumstances so unfavourable. But if the wheel with its pipes were entirely made of wood, it might in many cases succeed better; or the pipes might be made of tinned copper, or even of earthenware, which might be cheaper and lighter than lead. See *fig. 15.*

The centrifugal force, which is an impediment to the operation of Wirtz's machines, has sometimes been employed together with the pressure of the atmosphere, as an immediate agent in raising water, by means of the rotatory pump. This machine consists of a vertical pipe, caused to revolve round its axis, and connected above with a horizontal pipe, which is open at one or at both ends, the whole being furnished with proper valves to prevent the escape of the water when the machine is at rest. As soon as the rotation

tion becomes sufficiently rapid, the centrifugal force of the water in the horizontal pipe causes it to be discharged at the end, its place being supplied by means of the pressure of the atmosphere on the reservoir below, which forces the water to ascend through the vertical pipe. It has also been proposed to turn a machine of this kind by the counter-pressure of another portion of water, in the manner of Parent's mill, where there is fall enough to carry it off. This machine may be so arranged, that, according to theory, little of the force applied may be lost; but it has failed of producing in practice a very advantageous effect. Young's Phil. vol. i. See CENTRIFUGAL Machine, and WHEEL.

SCREW, *Bed or Barrel*, a powerful machine for lifting heavy bodies; and, when placed against the gripe of a ship to be launched, for starting her. It consists of two large poppets, or male screws, having holes in their heads to admit levers to turn therewith, a bed formed of a large oblong piece of elm, with female screws near each end to admit the poppets, and a sole of elm plank for the heels of the poppets to work on. When used for launching of ships, the surface of the sole is inclined so as to stand square to the stem or gripe.

Hand-screws, or *jacks*, double or single, are used by hand to lift weighty bodies. It consists of an elm box, containing cogged iron wheels, of increasing powers. The outer one, which moves the others, is put in motion by a winch or handle on the outside. They are called single or double, according to their increasing force.

SCREW, in the *Manege*. See SPLENT.

SCREW-Pine, in *Botany*. See PANDANUS.

SCREW-Shell, the English name of the *Turbo*; which see. See also CONCHOLOGY.

SCREW-Tree, in *Botany*. See HELICTERES.

SCRIBE, SCRIBA, סֹפֵר, *sopher*, derived from סָפַר, *saphar*, numeravit, whence סֵפֶר, *sepher*, liber, a principal officer in the Jewish law, whose business was to write and interpret scripture.

The Scribes, according to the etymological meaning of the term, were persons employed about books, writings, numbers, or accounts; in transcribing, reading, explaining, &c.

We find no mention of Scribes, in the Old Testament, before Ezra, chap. vii. 6, whence some learned men have concluded, that the office was brought from Chaldaea and Assyria, and first established by the Jews after their return from the Babylonish captivity. However, Ezra's being called a Scribe, which was a general title given to men of literature, will not prove the office of ecclesiastical Scribes, as it occurs in our Saviour's time, to have been so ancient. It probably grew up by degrees, after the spirit of prophecy ceased among the Jews; for when they had no prophet to resolve their doubts about doctrine or worship, they fell into disputes, and split into sects and parties; which made an order of men necessary, whose proper business it should be to study the law, that they might explain and teach it to the people.

The Scribes were in great credit and esteem among the Jews, and had even the precedence of the priests and sacrificers.

The Scribes are referred by most authors to two general classes: viz. *civil*, and *ecclesiastical* Scribes: the former were employed about any kind of civil writings or records, and the latter were such as addicted themselves to studying, transcribing, and explaining the holy scriptures. Of the *civil* Scribes there were various ranks and degrees, from the common scrivener, or public notary or schoolmaster, to the principal secretary of state. As for the *ecclesiastical* Scribes,

they were the learned of the nation, who expounded the law, and taught it to the people; and they are, therefore, sometimes called νομοδιδασκαλοι, *doctors of the law*, or νομικοι, *lawyers*. Compare Matt. xxii. 35. with Mark, xii. 28. These Scribes, who were generally Pharisees, were the preaching clergy among the Jews; and whilst the priests attended the sacrifices, they instructed the people. But though the greatest part of the Scribes took part with the Pharisees, and adhered to their opinions and tenets, as we learn from the gospel-history, yet it is probable, from several passages of the New Testament, that some of them were of the sect of the Sadducees. Some of the Scribes made it their business to explain the traditions, which they called the oral law, that is, the law delivered by word of mouth, which, as they pretended, had been conveyed from Moses down to them, from generation to generation, by the tradition of the elders. They much respected these traditions, considering them as the key of the law, and giving them the preference to the law itself. Hence this blasphemous maxim: "the words of the Scribes are more lovely than the words of the law of God." But it is evident, from the frequent reproaches pronounced by our Saviour on the Scribes and Pharisees in reference to this point, that under pretence of explaining the law by their traditions, they had actually made it of no effect. Matt. xv. 2, 3, 6. Mark, vii. 7, 8, 9. The Talmud will amply justify these reproaches.

Jof. Scaliger endeavours to establish a distinction between the Scribes of the people, referred to by Herod, Matt. ii. 4, and the Scribes of the law. The former he considers as a sort of public notaries, who were employed in secular business; the latter as preachers and expounders of the law. But the phrase, *Scribes of the law*, no where occurs in scripture; and the *Scribes of the people*, whom Herod consulted, were applied to, on account of their skill in explaining scripture prophecies. (Matt. xvii. 10.) And they were probably called Scribes of the people, because they were the stated and ordinary teachers of the people. (Mark, i. 22.) Camero observes, that a key was delivered to each Scribe, as a badge of his office, when he first entered upon it, to which our Saviour may be supposed to allude, Luke, xi. 52.

SCRIBE, *Scrība*, was also the title of an officer among the Romans, who wrote decrees or acts, and made out authentic copies of them.

Every magistrate had his *scriba*, or secretary; so that there were *scribae edilium*, *praetorii*, *questorii*, &c.

The *scriba* were not admitted to the management of the principal offices of the republic, unless they relinquished their profession.

In the time of the emperors, they were also called *notarii*; because they made use of abbreviations, and short notes, in writing.

SCRIBING, in *Joinery*, &c. a term used, when one side of a piece of stuff being to be fitted to the side of some other piece, which last is not regular; to make the two join close together all the way, they scribe it.

That is, they lay the piece of stuff to be scribed close to the other piece they intend to scribe to, and open their compasses to the greatest distance the two pieces any where stand from each other; then, bearing one of the legs against the side to be scribed to, with the other point they draw a line on the stuff to be scribed. Thus have they a line on the irregular piece parallel to the edge of the regular one; and if the stuff be wrought away exactly to the line, when the two pieces are put together they will seem a joint.

SCRIBONIUS LARGUS, in *Biography*, a Roman physician, who lived in the reign of Claudius, and is said to have accompanied this emperor in his campaign in Britain. He wrote

wrote a treatise "*De Compositione Medicamentorum*," which is very often quoted by Galen, and was "most impudently pillaged and transcribed" by Marcellus the empiric, according to Dr. Freind. This work Scribonius dedicated to Julius Callistus, the most favoured of all the freed-men of the emperor; and he speaks of Messalina and Claudius in a way which evinces that they were living at that time. After giving the formula of a dentifrice, he adds, "*Messalina Dei nostri Cæsaris hoc utitur.*" Great faith was, in that age, imposed in particular formulæ, or combinations of drugs, which were supposed to possess peculiar powers of healing; and it was the practice of many physicians to keep their compositions secret. Scribonius, however, published his collection, and expressed great confidence in their efficacy; but many of them are trifling and founded in superstition, and his practice seems to have been purely empirical. His language, too, is so much inferior in point of elegance to that of Celsus, who had written but a short time before him, and to the general character which the language still maintained in the reign of Claudius, that some learned men have supposed that Scribonius wrote his work in Greek, and that it was translated into the Latin dress, in which it has descended to us, by some later hand. Rhodius, however, and some others, have shewn that his language has the air of originality; and it is remarked, that in his dedication to Callistus, he thanks the favourite for having seized the opportunity of serving him by presenting his medical works, *written in Latin*, to the emperor: "*Scripta mea Latina medicinalia.*" It is remarkable, indeed, that two men, living about the same time, should write their native language so differently as Celsus and Scribonius; but the latter was probably a man of inferior education. The sarcasm of Freind is, however, not far from the truth. "Scribonius Largus, who cannot," he says, "well be reckoned any more than a mere empiric, though he wrote in the time of the first Claudius, when the Roman language was in some tolerable degree of purity, ought, as I may say, to be translated into Latin, in order to be understood by those who are conversant only with the classics of that age." The treatise of Scribonius has been several times reprinted, and stands among the "*Medicæ Artis Principes*" of Henry Stephens, 1567. See Freind's *History of Medicine*, vol. i. Sprengel, *Geschichte der Arzneikunde*, ii. Theil. Le Clerc, *Hist. de la Médecine*, p. 3.

SCRINIA, in *Geography*, a river of France, which runs into the Po, five miles N. of Tortona.

SCRIPTORIUM, a particular apartment in monasteries, where writers were employed in transcribing copies of works intended for preservation; and to their labour the cause of literature has been much indebted.

SCRIPTORIUS CALAMUS. See CALAMUS.

SCRIPTUARY, among the Jews. See CARAITES.

SCRIPTULUM, among the Romans, the twenty-fourth part of an ounce, and equal to two oboli. See OBOLUS.

SCRIPTULUS, a word used by some instead of *scrupulus*, a scruple, or weight of twenty grains.

SCRIPTURA, in *Antiquity*, the name of the revenue which the Roman people raised upon the pasture-lands, of which the property was in the commonwealth, and which was farmed to particular persons. It was so called, because the number of cattle, which individuals were to put into these pasturages, was registered; and it was by that number the yearly sums which they engaged to pay were regulated.

SCRIPTURE, or SCRIPTURES. See BIBLE.

The collection of tracts, says the learned and justly

esteemed sir William Jones, in his "eighth anniversary discourse," (*Works*, vol. iii. p. 183, 8vo.) which we call from their excellence "the scriptures," contains, independently of a divine origin, more true sublimity, more exquisite beauty, purer morality, more important history, and finer strains both of poetry and eloquence, than could be collected within the same compass from all other books that were ever composed in any age or idiom. The two parts, of which the scriptures consist, are connected by a chain of compositions, which bear no resemblance in form or style to any that can be produced from the stores of Grecian, Indian, Persian, or even Arabian learning; the antiquity of these compositions no man doubts; and the unstrained application of them to events long subsequent to their publication, is a solid ground of belief, that they were genuine predictions, and consequently inspired. Our author, in a subsequent discourse, adds, that on the supposition, that the first eleven chapters of the book, which it is thought proper to call "*Genesis*," are merely a preface to the oldest civil history now extant, we see the truth of them confirmed by antecedent reasoning, and by evidence, in part highly probable, and in part certain; but the *connection* of the *Mosaic* history with that of the Gospel, by a chain of sublime predictions, unquestionably ancient, and apparently fulfilled, must induce us to think the Hebrew narrative more than human in its origin, and consequently true in every substantial part of it, though possibly expressed in figurative language; as many learned and pious men have believed, and as the most pious may believe without injury, and perhaps with advantage, to the cause of revealed religion. If Moses then, subjoins our author, was endowed with supernatural knowledge, it is no longer probable only, but absolutely certain, that the whole race of men proceeded from *Iran*, or from a centre, whence they migrated at first in their great colonies (*viz.* Indian, Arabian, and Tartarian); and that these three branches grew from a common stock, which had been miraculously preserved in a general convulsion and inundation of this globe.

SCRIPTURE, *Canon of*. See CANON.

SCRIPTURE, *Scoffing, &c. at*, is punishable by fine and imprisonment. See BLASPHEMY.

SCRIVEN, in *Geography*, a county of America, in the state of Georgia, containing 4477 inhabitants. Its chief town is Jackson-borough, containing 20 inhabitants.

SCRIVENER, one who lends money out at interest; it is also used for one who draws contracts.

Scriveners are mentioned in the statute against usury and excessive interest of money. (12 Ann. cap. 6.) If a scrivener is entrusted with a bond, he may receive the interest; and if he fails, the obligee shall bear the loss; and so it is if he receive the principal, and deliver up the bond; for being entrusted with the security itself, it shall be presumed he is entrusted with the power to receive the principal and interest; and the giving up the bond on payment of the money is a discharge thereof; but if a scrivener be entrusted with a mortgage-deed, he hath only authority to receive the interest, not the principal; the giving up the deed in this case not being sufficient to restore the estate, but there must be a re-conveyance, &c. Decreed in Chan. Hill. 7 Ann. 1 Salk. 157.

SCRIVERIUS, PETER, in *Biography*, an estimable man of letters, was born at Haerlem in 1576. He was educated first at Amsterdam, where he had an uncle in the magistracy, and then at Leyden, with a view to the profession of the law, but having a decided turn for literature, he married and fixed his residence at Leyden, devoting his time to reading and writing. He became the editor of

many ancient authors, which he illustrated by comments of his own: among these works were those of Vegetius, Frontinus, Hyginus, Apuleius, Martial, and Seneca the tragedian. Scriverius wrote a work in the Dutch language on the "History of Printing," in which he maintained the claim of Laurence Coster to the invention of that invaluable art. He published a collection of Batavian antiquities, and other pieces relative to the early history of the united provinces. Scriverius, at the age of 74, lost the use of his eyes, but he continued to solace himself with literature till his death in 1660. His funeral was attended by the university of Leyden in a body, and an eulogy was pronounced over him by Frederic Gronovius. A collection of philological and poetical pieces from his MSS. was published at Utrecht in 1737. Moreri.

SCROBICULUS CORDIS, in *Anatomy*, the small depression in the middle of the upper part of the abdomen, just over the ensiform cartilage. In common language it is called the pit of the stomach.

SCROBILUM, in *Ancient Geography*, a promontory of the Arabic gulf, which separated the Heroopolitic and Elanitic gulfs.

SCROFA, in *Zoology*. See **SUS**.

SCROFA, in *Ichthyology*. See **SCORPÆNA**.

SCROFA, in *Entomology*. See **SCARABÆUS**.

SCROFANELLO, in *Ichthyology*, a name by which some have called a small fish of the Mediterranean, more usually known by the name of the scorpæna.

SCROFULA, or **SCROPHULA**, from *σχοφα*, *swine*, called also *struma*, or the king's evil, in *Surgery*. The name of scrofula was derived from an opinion that swine were particularly subject to this disease. The scrofulous constitution is observed to be, in many instances, denoted by particular symptoms. The complexion is often fair, and the colour of the hair either reddish, or of some other light tint; people with dark complexions and black hair being much less subject to scrofulous complaints. The skin is remarkably soft and white, and the face often has a shining polished smoothness. The cheeks are in general florid; and the tunica albuginea is frequently of a dead white colour, and more pale than usual. The edges of the eye-lids are sometimes affected with a degree of tenderness which easily degenerates into a troublesome inflammation, that distresses the patient by its continuance, and produces a disagreeable degree of deformity. There is likewise frequently a swelling of the upper lip, with some thickening of the nostrils and point of the nose. Russell on Scrofula, p. 8.

One of the most frequent symptoms of scrofula is a swelling in the superficial lymphatic glands, especially in those of the neck. Such glands swell without any previous complaint, and often attain a large size before the swelling attracts notice. The swellings are frequently unaccompanied with pain or discolouration; a circumstance which favours the conclusion that the inflammation attendant on scrofulous disease is slow, and the complaint of an indolent nature.

The frequency and great number of such tumours of the lymphatic glands have led many surgeons to suppose scrofula to be altogether a disease of the lymphatic system. Mr. Russell, however, entertains doubts respecting the accuracy of the doctrine; for he observes that many other parts of the body, which are not very glandular, are often the primitive seat of scrofula. It very frequently attacks the joints of the extremities, the bones, and the mucous membranes, without any previous or concomitant affection of the lymphatic system. Besides, it is to be recollected that the absorbent system is not only liable to idiopathic attacks of scrofula, in common with the rest of the body, but is

likewise exposed to suffer symptomatically, in consequence of the disposition of the glands to swell and inflame from any cause of irritation propagated along the course of the absorbents; and from this source of error the commencement of scrofula in the lymphatic system may be supposed more frequent than what the natural proportion of idiopathic cases warrant.

Scrofulous swellings of the glands are often stationary, or at least very slow in their progress of increase or diminution. The same indolence and absence of inflammatory symptoms, which characterize scrofulous swellings of the lymphatic glands, likewise distinguish similar affections in other parts of the body. The commencement of the attack is, in general, unperceived, and the progress slow; though the tumefaction which follows is frequently very considerable.

The greater number of scrofulous affections are accompanied with a preternatural swelling of the parts attacked. The tumour is of two kinds, one remarkable for its softness, the other of a more firm consistence. Soft scrofulous tumours are always formed by the effusion of a fluid, and it may be remarked that they are somewhat variable in their size, being one day more prominent and tense, the next more sunk and flaccid. When they are opened in the early state, they are found to contain nothing but a serous fluid, which lies in the cells of the cellular membrane. As the fluid is not contained in one common cavity, the tumour has a soft flabby feel, and imparts to the fingers of a surgical examiner no distinct sensation, either of elasticity or fluctuation. But when the fluid has been for some time effused, a striking difference occurs, a fluid lodged in a particular cavity now being evidently perceptible. This change seems to proceed from the destruction of the partitions which are between the cells of the cellular substance. As these collections, however, are not accompanied with any sensible degree of inflammation, they are not surrounded with a firm, solid, circumscribed base; and they do not betray any great tendency to ulcerate the skin, and burst of their own accord. Hence they sometimes become very prominent, and the skin is gradually distended to a surprising degree.

The matter contained in such tumours also undergoes a change. After a time, the more solid parts are deposited in the form of little masses, resembling coagulated milk. The remaining portion of the fluid is rendered thinner, and resembles whey. A quantity of purulent matter is also formed on the internal surface of the cavity, which seems to be attacked with a slow kind of inflammation. The admixture of this purulent matter greatly changes the appearance of the contents of the tumour, and they now bear more resemblance to those of a common abscess. They never acquire, however, exactly the properties of healthy purulent matter, being always thinner, more transparent, and more of a greenish colour.

Although the tendency to ulceration is not considerable, the skin at length gives way, and allows the matter to escape through a narrow opening. After the contents are evacuated, the tumour subsides; but there being in general little disposition in the parts to heal, a scrofulous sore is usually formed, which discharges unhealthy matter, and continues open for an indefinite length of time.

The other more firm kind of scrofulous swelling always increases slowly, and most commonly attacks the neighbourhood of joints. The affected part enlarges, without acquiring any circumscribed determinate form. By degrees, the tumour becomes softer, and at last particular portions near the surface become more prominent, inflame, suppurate, burst, and discharge matter. But as the suppuration is only partial, and the discharge inconsiderable, they have little

effect

SCROFULA.

effect in diminishing the size of the swelling, or in producing any other change of importance. The only difference occasioned is the addition of little ulcerations, which lead to sinuses, and emit matter.

A common abscess in a person of a scrofulous constitution often exhibits appearances, which betray the diseased state of the system. The matter first secreted is formed with extraordinary rapidity; the swelling is somewhat more transparent; the surface more shining, and the colour of the tumour more blue, than is observable in a case of healthy abscess. Scrofulous abscesses also contain, before they burst, a larger quantity of purulent matter, in relation to their size, than common phlegmonic abscesses. When abscesses in scrofulous patients burst, an empty cavity is not left; but there is seen a mass of cellular membrane apparently deprived of life. It resembles wet cotton, and often separates in the form of a solid mass. The separation is effected without pain. This state of the cellular membrane bears some remote analogy to the death of the central parts in a carbuncle; but it differs from the latter disease by there being no malignity, pain, nor danger.

The bones of scrofulous people partake of the general disease in the constitution; they seem to contain a smaller proportion of the phosphate of lime, and a larger one of gelatinous matter, than what exists in the composition of a healthy bone. They are also exceedingly susceptible of morbid action. The particular changes, however, induced in the bones by scrofula, will be noticed in the articles *SPINE*, *Curvature of*, and *WHITE SWELLING*.

With regard to scrofulous ulcers, their margin is commonly of a pale red or purplish cast, with a shining surface; the edges in general thin; and the surface of the sore sunk somewhat below the level of the surrounding parts. These sores are mostly attended but with a small degree of inflammation, and little pain; they are not very fensible, and have no great disposition to spread. The matter discharged from them is viscid, having very little colour, and often an offensive smell. In consequence of its viscosity, it adheres to the surface of the sore, and covers the granulations. It is to be observed, however, that scrofulous ulcers sometimes assume a more malignant aspect, having elevated indurated edges, and fungous central granulations, accompanied with pain and an ichorous discharge. In these cases, they may counterfeit the appearance of cancerous ulcers; but though the resemblance may be very imposing, we are in general able to ascertain the real nature of the case, by tracing its history from the commencement, and by inspecting the rest of the patient's body with accuracy; when the vestiges of former scrofulous sores, or other proofs of a scrofulous constitution, often manifest themselves.

Scrofulous sores often continue to discharge for a long while, with very little change of appearance. In time, however, they begin to heal, and, for the most part, dry up altogether at last, leaving a very ugly red irregular cicatrix, upon which the skin seldom recovers its natural look.

In general, scrofulous complaints are most troublesome in the spring, and get better towards the end of the summer. Russell on Scrofula.

Scrofula has always been considered as an hereditary disease. Many well-informed men have thought the application of the term, *hereditary*, to scrofula, and indeed to diseases in general, exceedingly wrong, because the affections in question do not regularly descend from parents to children, and sometimes attack persons, none of whose relations are known to have had such diseases. That there is truth in these arguments must not be disputed. But it is at the same time certain, that the children of scrofulous parents are much

more likely to be affected with scrofula, than the offspring of persons who never have had any symptoms of this disease. The children of scrofulous parents may, however, remain during life free from every mark of the disease. This fact is not at all questioned by such writers as employ the term *hereditary*; for the whole of their meaning is, that scrofulous parents more frequently have scrofulous children, than is the case with perfectly healthy parents. The offspring of the former, however, are not certain of being diseased in this manner; nor are the children of the latter sure of not being so.

Scrofula is undoubtedly not a contagious disease, nor can it be communicated by contact, or even inoculation. Korkum tried to transfer scrofula from one person to another by inoculation; but although he took great pains to insert the matter completely, and repeated the experiment frequently, yet all his attempts failed, as no disease was communicated to the person inoculated, nor even any very evident irritation excited at the place where the matter was inserted. De Vitio Scrofuloso, p. 218.

The proximate cause of scrofula is a subject, concerning which many conjectures have been started; but none that appear to carry with them much probability. It is indeed a question, that is at present not at all understood.

Of all occasional causes, says Mr. Russell, climate is the most powerful. The extremes of heat and cold are equally free from scrofula. It prevails most in those climates, where the atmosphere is perpetually loaded with cold vapours; where the seasons are variable, and no weather steady. From latitude 45° or 50°, to latitude 60°, is the principal climate of scrofula. The climate of Scotland, which is within this range, is remarkable for the frequent occurrence of scrofulous complaints. When the temperature of the air is just above the freezing point, the cold is the most difficult to bear, on account of the great quantity of watery vapours which float in the atmosphere. A greater degree of cold condenses the aqueous vapours, and renders the air clear: a greater degree of heat disperses them. Accordingly, it is an universal observation, both in the torrid and the frigid zone, that perfectly dry air, whether produced by great heat, or great cold, always brings the most healthy weather. Mr. Dobson, in his account of the *harmattan* wind, which blows on the coast of Africa, and is so warm and dry as to accomplish the crystallization of pure alkali, observes, that all endemic diseases get well during the blowing of this wind. Mr. Graham, likewise, who was long governor of the Hudson's Bay factory, situated on the east coast of America, about the 60th degree of north latitude, makes nearly a similar observation with respect to intense cold; as he invariably found, that the raw, cold, damp weather, when the mercury in Fahrenheit's thermometer stands between 30 and 40 degrees, was the most intolerable to bear, and the most unfriendly to health. Now this (continues Mr. Russell) is very nearly the winter weather of Scotland. Upon the whole, therefore, we may lay it down as a general maxim, that the greatest degree of cold, which can be conjoined with moisture, is the state of weather which tends most to favour the appearance of scrofula.

The long continuance of inclement weather increases the predisposition to scrofula; and in persons already sufficiently predisposed to the disease, any uncommon, though temporary exposure to cold and wet, is often an exciting cause of an immediate attack.

Every thing which weakens the constitution, predisposes to scrofula. Thus, breathing impure air, and living upon a scanty allowance of unwholesome indigestible food, promote the access of scrofula. The same may be said of

SCROFULA.

uncleanliness; neglect of salutary exercise; confinement in cold damp situations; and the want of sufficiently warm clothing.

But one of the most frequent occasional causes of scrofula is external violence. Many accidents, which would not be followed by any serious consequence to a person in health, produce severe scrofulous affections in persons predisposed to these diseases.

It is almost unnecessary to mention, that all those circumstances which have been specified as occasional causes, must be avoided.

There is no medicine which, internally administered, has the power of completely correcting the peculiarity of constitution implied by the expression *scrofulous habit*. But there are many medicines which seem to improve this state of the system, and to promote the spontaneous amendments, which stumous affections frequently undergo. Scrofulous patients, for the most part, have constitutions in which the natural actions do not proceed with vigour, and perhaps it is on this account, that every thing tonic is more or less useful in cases of stumous disease. This observation is not meant, however, to forbid the judicious employment of evacuations, which, when the habit is disposed to plethora and costiveness, are indispensably necessary.

The medicines which are given for the cure, or prevention of scrofula, are either such as are supposed to act upon some general principle, or such as are supposed to possess a specific virtue in the cure of this distressing disease.

A draught of salt water is recommended almost indiscriminately to every patient who is advised to use sea-bathing. It acts as a purgative, and proves a serviceable medicine, so far as purging is indicated. The water of the sea, however, is not nearly so palatable, as the solutions of many of the neutral salts, and its medicinal virtues do not appear to be superior. Hence Mr. Russell believes, that it is prescribed rather from accidental convenience, than from its being in reality a better medicine than several others.

In some cases of hereditary predisposition, scrofula seems engrafted on a constitution, otherwise healthy and vigorous, where the patient feels no weakness, has no disorder of the stomach, and at the same time has tendency to fulness and corpulency. In cases of this kind, a continued course of purgative medicines often proves highly beneficial by procuring a frequent and copious evacuation of the bowels, and thereby reducing that disposition to fulness, which very much promotes the formation of glandular swellings. But, in general, scrofula is not combined with the foregoing sort of constitution, and purgatives are then only useful for the purpose of obviating costiveness.

Several mineral springs, besides saline ingredients, contain sulphureous impregnations, which are supposed to increase the medicinal virtues of the waters. The reputation of the waters of Harrowgate and Moffat is universally known. Mr. Russell acknowledges that their efficacy may have been over-rated; but he still thinks favourably of their effects in cases of scrofula.

Calomel, or, as it is now called, the hydrargyri submurias, is the most celebrated of all the purgative medicines, which have ever been employed in the treatment of scrofula. In order to derive the greatest benefit from it, however, it should not be given in so large a quantity as to produce the specific effects of mercury in their full extent; for, as Mr. Russell observes, a deep and lasting impression on the system aggravates every symptom of scrofula. Calomel, taken in moderation, contributes more than any other medicine to dissolve tumours, and resolve scrofulous indurations. An alterative course with this medicine, however, must be main-

tained a sufficient length of time, in order to prove successful; constant attention being paid that the effects of the calomel do not amount to salivation, and severe mercurial action.

With respect to tonics for the cure of scrofula, the most esteemed of the vegetable class is the Peruvian bark. Mr. Russell observes, that cinchona is only useful, when the bowels have been previously cleared of any morbid accumulation of feces; and that, under other circumstances, it oppresses the stomach, and does harm, instead of good. Neither, says he, is it adapted to that state of scrofula, in which any tendency to fulness prevails, or when the glands are swelled and indurated, or congestions are present to any extent. But when none of these objections to the administration of cinchona exist, when weakness is a principal symptom, when the strength is to be supported, and a languid action to be roused into more vigorous exertion, cinchona may be usefully employed, and has obtained the character of an excellent medicine. Its virtues are best calculated to meet the indications of those cases, where there are extensive ulcers, or large abscesses, with copious exhausting discharges of purulent matter; and, in general, to communicate that degree of energy to the actions of the system, which tends to support and confirm the patient's strength. The simple powder is the preferable mode of exhibition, when the stomach can digest a sufficient quantity without oppression; but if a dose in substance oppresses the stomach from indigestion, then the lighter preparations of infusion, or decoction, ought to be substituted. Two or three doses a-day are as much as can ever be requisite. A course of this kind may be continued for two or three weeks; it may then be left off for eight or ten days, and afterwards resumed again.

Of the mineral tonics, iron and sulphuric acid are the most valued for their efficacy in cases of scrofula. Iron is less liable than cinchona to oppress the stomach, or produce accumulation in the bowels. Mr. Russell also thinks that it acts more speedily and powerfully on the constitution. The dose may be increased so long as the stomach can bear the quantity without oppression; and the medicine may be given without intermission for some weeks. The carbonate of iron, the muriatic solution, and the chalybeate waters, are the best forms in which the medicine can be given.

The sulphuric acid is grateful to the stomach, and agrees with all forms and stages of scrofula. It is, according to the experience of Mr. Russell, peculiarly adapted to that state of fever, which is connected with the putrid sloughs, that are often formed on the inside of large tumours, when first exposed to the air; and to that state of weakness, which disposes to copious perspiration, upon every moderate exercise. The best mode of taking it is diluted with water, and sweetened, so as to form a common beverage.

Having noticed the effects of purgative and tonic medicines, we proceed to the consideration of remedies, which have been supposed to possess specific virtues in the case of scrofula. The cicuta, or conium maculatum of Linæus, was most highly praised by the celebrated Dr. Storck of Vienna. Upon the recommendation of this respectable practitioner, says Mr. Russell, it was universally tried all over Europe, so that a fair estimate of the medicinal virtues of cicuta, in the cure of scrofula, may be made from the result of very general and extensive experience. Its original character, as an invaluable acquisition in the cure of scrofula, was certainly much over-rated; although it appears to possess some useful qualities, which may be advantageously employed in certain modifications of the disease. Mr. Russell thinks favourably of this medicine, for its efficacy

SCROFULA.

quacy in changing the condition and forwarding the cure of certain malignant scrofulous ulcers, which counterfeit the appearance of cancer. He has likewise found it of service in promoting the cure of certain scrofulous affections of the tongue, which bore a near resemblance to some rare venereal cases. In a few cases, Mr. Russell has had reason to ascribe to cicuta some share of efficacy in promoting the resolution of scrofulous swellings of the breast. The medicine must be given in as large doses as the constitution can bear. The head being affected with a degree of giddiness, and the stomach with a little nausea, is the criterion of the dose being sufficiently powerful.

The muriated barytes has been recommended by Dr. Crawford; but though it has been frequently exhibited, its reputation is far from being increased; a sure proof that its virtues were originally exaggerated.

The muriate of lime is another remedy that has been of late much talked of, for its good effects as a specific in cases of scrofula. In order to derive the utmost benefit from it, Mr. Russell is of opinion that it is necessary to prescribe it in much larger doses than those which have usually been directed. One of the most successful instances of its efficacy was the consequence of an ounce of the saturated solution having been taken, for many weeks, three times a day. It well deserves attention, however, that professor Thomson employed muriate of lime in various cases of scrofula, without a single example of its having any efficacy. He admits that some patients got well, while under a course of muriate of lime; but then he had no reason to ascribe the cure to the effect of the medicine. In other cases, on the contrary, he found that the muriate of lime produced severe sickness and oppression of the stomach, and that the patients got daily worse, till the medicine was left off, and other remedies employed. The relief, experienced from the discontinuance of the muriate of lime, left no doubt with regard to the injurious effects which the use of it had produced; and from extensive experience and accurate observation, professor Thomson is satisfied that, in many cases of scrofula, the muriate of lime is attended with prejudicial effects.

With respect to the local treatment, stimulant applications are found not to be in general advantageous for scrofulous complaints. For ulcers, the most simple and mild dressings are the best. When the patients are using a course of sea-bathing, it is usual to wash the sores with sea-water frequently every day. Cold spring water is likewise a favourite application; and experience seems to prove that the operation of cold is well suited to counteract the state of inflammation which accompanies scrofulous sores. Preparations of lead are, upon the whole, very convenient and useful applications, provided the solutions be used in a state of sufficient dilution to prevent irritation. Liquid applications are made by means of wet linen, which is renewed whenever it dries, so that the surface of the sore is kept constantly moist.

Upon the same principle, simple ointment and Goulard's cerate are, in ordinary cases, the best dressings.

The employment of simple applications and of cold, however, is more properly adapted to the mild and pure forms of scrofulous sores; for when these are more malignant, or combined with any other disease, a different mode of dressing becomes necessary. Venereal sores, for instance, breaking out in a person of a scrofulous constitution, partake of the nature of both disorders, and require correspondent treatment. Even a pure scrofulous sore, attended with more inveteracy than usual, may demand particular sorts of dressings, different from such as are found to be most proper

for common cases. When the ulcer is extremely indolent, gentle stimulants may be necessary; and when there are fungous granulations, they must be destroyed by escharotics.

Those scrofulous swellings which contain a fluid, when they are superficial, and not connected with any parts of importance, are in general better left untouched. They are very slow in their progress, but they mostly burst at last by a superficial ulceration, which forms a small aperture. They do not often admit of resolution. The most likely applications for promoting this desirable object, are solutions of the acetite of lead, and of the muriate of ammonia.

The progress of the cure, after the tumour has discharged its contents, is very various; though, upon the whole, it is slow, and the cure often incomplete. The sides of the cavity seldom adhere uniformly, or granulate from their whole surface; so that little partial separate cavities remain, which form sinuses, and continue to discharge matter, accompanied with some degree of pain and inflammation. At last, however, often indeed after a considerable time, the discharge ceases altogether, and the sore completely heals. When the sinuses continue for a long time, without any tendency to get well, it is sometimes proper to open them to the bottom with proper incisions; but in the generality of scrofulous cases, such practice is, upon the whole, severe, disadvantageous, and even dangerous.

Scrofulous abscesses, when not large, need not to be opened; but deep-seated collections of matter, which increase gradually in size, without shewing any disposition to make their way to the surface of the body, ought to be opened: for if this be not done, the matter spreads, and the disease acquires by degrees a dangerous extent. The opening should not be larger than what is sufficient for the complete evacuation of the matter; because a large opening excites great irritation, and is often the cause of violent inflammation of the whole cyst of the abscess, attended with alarming, and often with fatal, consequences. The fever that occurs is accompanied with a rapid train of symptoms, which speedily end in death. In other instances, the fever is hectic, being more slow in its progress, though not less certainly fatal. According to Mr. Russell, sulphuric acid and saline draughts, in a state of effervescence, are the medicines which agree best with both forms of fever; and he observes, that neither of them seems to be much relieved by the use of cinchona. (P. 116.) This author recommends opening the tumour with a trocar, letting out the whole of the contents, withdrawing the cannula, and bringing the sides of the puncture together with sticking plaster. For our own part, we prefer making the opening with a lancet, and then closing the wound with adhesive plaster, as advised by Mr. Abernethy in cases of psoas abscess. See *Psoas Abscess*.

With respect to the treatment of swelled glands, it is to be remarked, that it is always desirable to prevent suppuration. When the glands are superficial, their progress may be influenced by topical applications; but when they are deep, they are scarcely capable of being affected by such remedies. In ordinary cases, Mr. Russell recommends the use of fomentations two or three times a day. Sea-water, vinegar, and water, dilute solutions of the acetite, or muriate of ammonia, and a decoction of chamomile, are eligible for fomentations. Friction with camphorated and ammoniated oils, and with marine plants, has also been well spoken of.

In such cases, Mr. Russell, however, does not place much confidence in external applications, as he considers that the cure chiefly depends upon the state of the constitution, upon regimen, and the effect of internal remedies.

When

When enlarged glands, which lie superficially, are attacked with inflammation, and in danger of suppurating, Mr. Russell strongly recommends the frequent use of topical bleeding. This author is also an advocate for blisters, both at the commencement of the inflammation, and on its decline.

When the swelled glands suppurate, and healthy inflammation predominates, the case must be treated nearly in the same way as a common abscess. An artificial opening is hardly ever necessary, as the abscess in a short time bursts of itself. The only instance, in which the surgeon is called upon to open the swelling, is when the matter shews a tendency to spread over a large space. When the suppuration is completely scrofulous, a small opening is at length spontaneously formed, through which all the matter is discharged. The aperture, though always small at first, sometimes becomes larger, and frequently it remains for a long while nearly in the same state, shewing little disposition to heal, acquiring a glossy appearance, and becoming thick and callous at its edges. In the end, however, a cicatrix is mostly produced.

In cases of indolent, stationary, scrofulous swellings of glands, where there is no hope of resolution, it has been proposed to remove or destroy the diseased glands by excision, or by the application of caustic. Such practice has been particularly suggested for glandular swellings of the neck. The superficial situation of the glands of this part of the body rendering them very apt to be affected by cold, the vicissitudes of the weather, and other external circumstances, they must be subject to temporary impressions. The frequency with which they swell, and the facility and suddenness with which they sometimes subside, afford strong arguments against an operation in recent cases. In other examples, where the affection has existed long, it often happens that other more deeply seated glands are also diseased, so that the removal of an enlarged superficial cervical gland would prove a very partial and useless operation, and would do nothing towards the total extirpation of the disease.

As for the mere removal of deformity, this is not an adequate reason for the operation, which would itself be followed by a scar, that must disfigure the part quite as much as the swelled gland could possibly do. We will say nothing of the danger and difficulty with which, in many cases, such an operation would be attended.

The attempt to destroy a scrofulous gland in the neck with caustic would be liable to objections, fully as strong as those which are applicable to the use of the knife. The action of caustic can never be regulated with much precision, and the cicatrix, produced in this manner, is always a considerable deformity.

Firm scrofulous tumours in the more external parts of the body do not usually require local bleeding, unless attended with symptoms of inflammation. It is chiefly in the early stage of such cases that the practice is advantageous. In general, warm fomentation, stimulants, issues, and blisters repeated, or kept open with the savine ointment, are the most eligible remedies. Here also the employment of friction as a discutient deserves particular recommendation. Its safety, simplicity, and efficacy, are now well acknowledged. There is no substance interposed between the surface of the swelling, and the hand of the person who is employed in rubbing it, except a little flour to prevent the skin from being chafed. The friction is to be applied two or three hours a day, and the plan continued for some months.

Permanent compression by means of tight bandages, or long strips of adhesive plaster, is another means of reducing

the indolent scrofulous induration and thickening of parts. But of this practice, and of dry rubbing, or friction, by the hand, we shall have occasion to speak in a future volume. See WHITE SWELLING.

When a scrofulous disease is circumscribed and incurable, and attended with so much pain and irritation, as to injure the health in a serious and dangerous degree, the removal of the part by an operation becomes indispensable. The symptomatic enlargement of the lymphatic glands, which are nearer than the disease to the heart, presents no solid objection to such practice; for this enlargement proceeds from irritation, and not from absorption; and the glands often subside, as soon as the original cause of their swelling is removed. Russell on Scrofula, p. 137.

SCROGS, in *Rural Economy*, a term provincially applied to such stunted shrubs as have been browsed upon by cattle, as hazel, &c. They are mostly met with on commons and waste lands.

SCROLL, in *Heraldry*, is the ornament placed under the escutcheon, containing a motto or short sentence, alluding sometimes to the bearings, or the bearer's name; sometimes expressing somewhat divine or heroic; sometimes enigmatical, &c. It is often placed by the French and Scotch above the achievement; which, according to sir J. Mackenzie, is right, when the motto relates to the crest; otherwise it should be annexed to the escutcheon. Those of the order of knighthood are generally placed round shields. See ESCROLL.

SCROLL, in *Ship-Building*, is a spiral moulding of the volute kind, used sometimes at the drifts, and the upper part of the hair-bracket. A *scroll-head* signifies that there is no carved or ornamental figure at the head, but that the termination is formed and finished off by a *volute*, or scroll turning outwards. If the scroll is turned off, or inwards, it is then called a *fiddle-head*.

SCROON, in *Geography*. See SCAROON.

SCROPHULARIA, in *Botany*, an old name, supposed by some to have been given to the herbs of this genus, because swine, *scrofae*, were fond of them. But the most probable derivation is from *scrophula*, the king's evil, for which disease some of them have been recommended as a cure; especially *S. nodosa*, whose knobby roots, compared to scrophulous tumours, are thought to have given rise to that opinion. Yet there can be no doubt that one of this genus is the real *γαστρικὸν* of Dioscorides, as Fuchsius, and some other old botanists, have maintained, which that original Greek writer on the materia medica celebrates for its virtues in the above-mentioned complaints, and even in cancerous ulcers. Yet his identical species, our *S. peregrina*, has no knobby roots. It is probable therefore that the above explanation is of more modern date, and it may account for the etymology of *Scrophularia*, if not for the application of the herb to medical use. The *Galeopsis* of Fuchsius is indeed *S. nodosa*; Anguillara being, as far as we can find, the first writer on drugs who fixed upon the precise plant of Dioscorides, *S. peregrina*, and whose opinion is confirmed by the recent enquiries of Dr. Sibthorp.—Linn. Gen. 312. Schreb. 408. Willd. Sp. Pl. v. 3. 269. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 662. Prodr. Fl. Græc. Sibth. v. 1. 435. Ait. Hort. Kew. v. 4. 22. Pursh v. 2. 419. Juss. 119. Tourn. t. 74. Lamarck Dict. v. 7. 27. Illustr. t. 533. Gært. t. 53.—Class and order, *Didynamia Angiospermia*. Nat. Ord. *Perfonate*, or rather *Luride*, Linn. MSS. *Scrophulariæ*, Juss.

Gen. Ch. *Cal.* Perianth of one leaf, inferior, with five rounded segments shorter than the corolla. *Cor.* of one petal, unequal, reversed; tube globose, large, inflated: limb very small, five-cleft; its two lower segments (turned uppermost)

SCROPHULARIA.

uppermost) largest, erect; two lateral ones spreading; the odd one (turned downwards) reflexed. *Stam.* Filaments four, linear, the length of the corolla, declining towards its lower segment, two of them later than the others; anthers two-lobed. *Pist.* Germen ovate; style simple, agreeing in length and position with the stamens; stigma simple. *Peric.* Capsule roundish, pointed, of two cells and two valves, bursting at the top; partition double, formed of the inflexed edges of the valves. *Seeds* numerous, small. *Receptacle* roundish, protruding into each cell.

Eff. Ch. Calyx five-cleft. Corolla nearly globular, reversed. Capsule superior, of two cells.

1. *S. marilandica*. Maryland Fig-wort. Linn. Sp. Pl. 863. Willd. n. 1. Ait. n. 1. Pursh n. 1. (*S. nodosa* β, *americana*; Michaux Boreali-Amer. v. 2. 21.)—Leaves heart-shaped, doubly serrated, acute, smooth; decurrent at the base. Stem with blunt angles. Footstalks connected by a hairy line.—In low grounds, from Pennsylvania to Carolina, flowering from June to August, perennial. *Flowers* greenish-brown. *Plant* often more than four feet high. *Pursh.* Mr. Miller is said to have cultivated this herb, but it is scarcely to be met with in gardens, nor could it be expected to engage much attention, being so like other common species, carefully weeded out of all gardens. What we have been shewn for it, in collections of primary authority, was *S. peregrina*. Michaux unites it with the following, but Linnæus appears correct in distinguishing them. Besides the greater size of *marilandica*, its leaves are doubly, and far more coarsely, serrated; their base, though heart-shaped, not cut away to the lateral ribs, but decurrent along the footstalk. An elevated hairy line runs across the stem, from the insertion of one footstalk to the other.

2. *S. nodosa*. Knotty-rooted Fig-wort. Linn. Sp. Pl. 863. Willd. n. 2. Fl. Brit. n. 1. Engl. Bot. t. 1544. (*S. major*; Ger. Em. 716. Scrophularia; Riv. Monop. Irr. t. 107. f. 1; also *S. minor*; ibid. suppl.)—Leaves heart-shaped, acute, nearly equally serrated, smooth; three-ribbed at the base. Angles of the stem acute.—Native of woods and hedges, in dry, rather fertile, places, throughout Europe, flowering in July and August. The root is perennial, tuberous, whitish. Stem two or three feet high, erect, simple, leafy, smooth. Leaves opposite, stalked, neatly and acutely serrated; of a shining dark green above; paler beneath. Flower-stalks axillary and terminal, forked, angular and glandular, purplish, with lanceolate bracts, and all together composing a compound, terminal, upright cluster, or panicle, interperfed with a few leaves. Calyx smooth. Corolla dull green, with a livid purple, or brownish, lip, bearing a small internal appendage. The whole herb, when bruised, has a fetid scent, something like Elder, which is common, under various modifications, to the whole genus.

This species is mentioned, by several authors, as varying occasionally with green flowers, of which we have seen an instance; as well as with three leaves together, instead of two.

3. *S. aquatica*. Water Fig-wort, or Water Betony. Linn. Sp. Pl. 864. Willd. n. 3. Fl. Brit. n. 2. Engl. Bot. t. 854. Curt. Lond. fasc. 5. t. 44. Fl. Dan. t. 507. (*Betonica aquatica*; Ger. Em. 715.)—Leaves heart-shaped, stalked, decurrent, obtuse. Stem winged.—Native of watery places, about the banks of lakes and rivers, from England to Greece; very rare in Scotland, and the northern parts of Europe; flowering in July. The root is fibrous, and, we believe, perennial, though Linnæus says biennial. Whole plant larger than the last, and distinguished by the membranous edges of its stem, as well as blunt leaves.

Cluster terminal, compound, bracteated, without leaves. Calyx bordered with a white membrane. Lips of the corolla of a deep blood-colour, with the same small intermediate lobe as in the former. Herb fetid, smooth.

4. *S. auriculata*. Ear-leaved Fig-wort. Linn. Sp. Pl. 864. Willd. n. 4. Ait. n. 4.—Leaves oblong-heart-shaped, doubly serrated; downy beneath; with a pair of leaflets at their base. Cluster terminal.—Native of Spain, from whence it seems Loeffling sent seeds, which produced the specimen in the Linnæan herbarium. This specimen appears to us a mere variety of *S. Scorodonia*, with accidentally auricled leaves; whereas the synonym of Lobel represents a precisely parallel variety of *S. aquatica*. The figure we have cited above, from Ger. Em. 715, is the same cut as Lobel's. Barrelier's t. 274 has not the character of the auricled leaves, and the foliage is all too long for the *Scorodonia*; see *betonicifolia* hereafter, n. 6. *S. auriculata* may therefore, if we mistake not, be reduced to a variety of the following species. We have not examined Mr. Aiton's plant, sent to Kew by Richard, in 1772. Scopoli's *auriculata*, Fl. Carn. t. 32, is most assuredly very different.

5. *S. Scorodonia*. Balm-leaved Fig-wort. Linn. Sp. Pl. 864. Willd. n. 6. Fl. Brit. n. 3. Engl. Bot. t. 2209. (*S. Scorodoniae foliis*; Morif. sect. 5. t. 35. Pluk. Phyt. t. 59. f. 5.)—Leaves heart-shaped, doubly serrated; downy beneath. Cluster leafy.—Native of watery bushy places in Jersey and Cornwall, as well as in Portugal and Italy, and near Constantinople, flowering towards autumn. Root perennial, fibrous. Stems two to four feet high, square, leafy, clothed, like the backs of the leaves, with soft spreading hairs. Leaves opposite, stalked, acute, various in size, veiny; three-ribbed at the base, like *S. nodosa*. Flower-stalks axillary and terminal, doubly forked, constituting a terminal leafy cluster, clothed with capitate glandular hairs. Flowers rather small, of a paler more livid hue than in our more common species, their intermediate, or accessory, lobe green. Calyx downy, obtuse. Capsule smooth.

6. *S. betonicifolia*. Betony-leaved Fig-wort. Linn. Mant. 87. Willd. n. 8. Ait. n. 7. (*S. betonica folio*; Tourn. Inst. 166. *S. aquatica montana mollior*; Barrel. Ic. t. 274.)—Leaves heart-shaped, oblong, somewhat downy, doubly toothed; veins radiating from the base. Panicle leafy. Calyx downy.—Native of Portugal. Cultivated by Linnæus at Upsal. Root perennial. Stem two feet high, square, slightly downy, purplish, especially at the bottom. Leaves all simple, rather large, acute, broad at the base, strongly and sharply toothed, each tooth again notched or serrated, even in the original specimen; nor do we comprehend the description of Linnæus, where he says "the teeth are quite entire, and therefore very like *Ebulus*." Flower-stalks branched and forked, rough with glandular hairs, and accompanied by toothed leaves. Corolla dull purple; its little lip, or accessory lobe, greenish.—This is nearly akin to the last, but we have little doubt of their being distinct species. Barrelier's figure is as good as most of his, and tolerably expressive. What he represents as leaflets on the stalk of his separate leaf, and which originally perhaps led Linnæus to quote this plate for his own *auriculata*, are probably small axillary leaves only.

7. *S. nepetifolia*. Catmint-leaved Fig-wort. (*S. auriculata*; Scop. Carn. v. 1. 446. t. 32.)—Leaves heart-shaped, obtuse, nearly smooth, simply serrated, on short broad footstalks. Cluster leafless. Bracts lanceolate. Calyx smooth. Gathered by Scopoli on the mountains of Carniola. We have a specimen, found by the late Dr. Broussonet at Tangier, flowering in June, which answers exactly to Scopoli's description, and seems not referrible to any of the species in Linnæus.

SCROPHULARIA.

Linnæus or Willdenow. In this the *leaves* are about an inch long, on broad, flat, smooth *footstalks*, a quarter of that length, along which the two lateral ribs are continued, by the side of the midrib; the margin of the *leaves* is neatly, regularly, and acutely ferrated. *Cluster* erect, long, quite naked, except the lanceolate *bractæas*; its side branches forked, rough, with glandular hairs. Segments of the *calyx* ovate, obtuse, smooth, bordered with a broad white membrane, within which the margin is of a brown or rusty hue, as Scopoli describes it. He says the *corolla* is yellow.

8. *S. glabrata*. Spear-leaved Fig-wort. Ait. n. 6. Willd. n. 7, excluding Vahl's synonym. Jacq. Hort. Schoenbr. v. 2. 44. t. 209.—Leaves oblong-heart-shaped, acute, doubly ferrated, smooth. *Cluster* leafless, panicked, compound. *Bractæas* lanceolate.—Found in the Canary islands, by Mr. Masson, who sent it to Kew in 1779. This is a biennial greenhouse plant, flowering in April and May. The *stem* is rather woody, square, branched, smooth like every other part of the plant. *Leaves* often unequal at the base, about two inches long, on *footstalks* half that length. *Clusters* long and many-flowered, with spreading three-forked branches; no leaves, except at the very bottom, but many lanceolate acute *bractæas*. *Flowers* of a deep blood-red.

9. *S. peregrina*. Nettle-leaved Fig-wort. Linn. Sp. Pl. 866. Willd. n. 26. Ait. n. 18. Camer. Hort. 157. t. 43. Sm. Fl. Græc. Sibth. t. 597, unpublished. (*S. folio urticæ*; Bauh. Pin. 236. *S. cretica altera*; Clus. Hist. v. 2. 210.)—Leaves heart-shaped, acute, simply ferrated, smooth and shining. *Stalks* axillary, two or three-flowered. *Bractæas* lanceolate. *Calyx* acute.—Native of Italy and Crete. Very common about hedges, paths, and court-yards throughout Greece, as Dioscorides describes his γαλιόφας to be. We cannot but accede to the opinion of Anguillara, Fuchsius, and Sibthorp, that this, and not our *Galceps*, was his plant. The *root* is fibrous, annual, or biennial. *Stem* two or three feet high, not much branched, occasionally with five or six angles. *Leaves* of a dark shining green, an inch or more in length; we cannot agree with Willdenow that the upper ones are generally entire, though such an accident may occur; as the upper part of the stem, now and then, in gardens, becomes elongated, and the foliage in that part diminished in size; but this is rarely the case. The natural state of the plant is to have axillary *flower-stalks* from near the bottom of the stem to the top, each bearing two, three, rarely more *flowers*, whose tube, as well as the limb, is of a blood colour, and the segments of the *calyx* are ovato-lanceolate, with sharp points, and no membranous edges. The *flower-stalks*, like the leaves which they accompany, are more or less distinctly alternate, rarely opposite. We have taken the liberty to remove this species from the end of the genus, to place it near those to which, both on account of its simple leaves and general habit, it is most closely allied. In doing this we shall here notice three others, which conclude the genus in Willdenow. Two of these, at least, require to be totally expunged, and the third, if it has any right to remain, must stand next to *peregrina*.

S. chinensis, Linn. Mant. 250, consists of an imperfect specimen of what seems to be an *Ocimum*, accompanied by a still more imperfect branch of what may be a *Celsia*, or *Verbascum*; but neither of them has any thing to do with *Scrophularia*, nor was Linnæus, when he originally described these specimens, at all satisfied about them.

S. meridionalis, Linn. Suppl. 280, sent by Mutis, is indubitably the same genus, and very nearly the same species, as *Hemimeris urticifolia*, Willd. Sp. Pl. v. 3. 282, *Alonsoa incisifolia*, Ait. Hort. Kew. v. 4. 27. The *capsule* only seems a little more elongated, and the *leaves* less deeply cut, than in

our garden plant; see *HEMIMERIS*. The shape of the *capsule* is indeed important in distinguishing the species of this genus. We are at a loss to distinguish *Alonsoa* from *Hemimeris*.

10. *S. coccinea*. Scarlet Fig-wort. Linn. Sp. Pl. 866. Willd. n. 25.—“Leaves ovate, four in a whorl. Flowers whorled, spoked.”—Native of Vera Cruz. Houstoun sent an account of this plant to Miller, by the name of *S. flore coccinea, foliis urticæ quaternis caulem ambientibus*. Hence probably this definition reached Linnæus, and it was all he ever knew of the plant, for he had no specimen. We should not be surprized if it proved another *Hemimeris*, which Houstoun might very excusably take for a *Scrophularia*. We now return to more certain species.

11. *S. orientalis*. Hemp-leaved Fig-wort. Linn. Sp. Pl. 864. Willd. n. 9. Ait. n. 8. “Schkuhr Handb. v. 2. 196. t. 173.” (*S. orientalis, foliis cannabinis*; Tourn. Cor. 9.)—Leaves lanceolate, sharply ferrated, opposite or whorled; auricled at the base. *Cluster* leafless, with whorled, corymbose, downy, viscid branches. *Flowers* drooping. *Calyx* smooth, obtuse.—Native of the Levant; sometimes seen in botanic gardens. The *root* is perennial. *Stem* with four, or more, acute angles, leafy. *Leaves* often three or four in a whorl, widely spreading, stalked, four or five inches long and one broad, smooth, copiously deeply, and rather unequally, ferrated; either sharply lobed, or furnished with a pair of lanceolate ferrated small leaflets, at the base. *Cluster* terminal, long, erect, its *branches* either opposite, or more usually three or four in a whorl, forked, many-flowered, rough with glandular hairs, and furnished with linear *bractæas*, but no leaves. *Flowers* greenish.

12. *S. lanceolata*. Lanceolate American Fig-wort. Pursh n. 2.—“Leaves lanceolate, pointed, unequally ferrated; acute at the base. *Footstalks* without appendages. *Branches* of the panicle corymbose.”—In wet meadows and woods of Pennsylvania, flowering in August and September. Perennial. *Flowers* greenish-yellow. *Pursh*. This seems nearly related to the last, to which the author has not adverted. We have seen no specimen.

13. *S. altaica*. White-flowered Fig-wort. Murr. in Comm. Gott. v. 4. 35. t. 2. Willd. n. 13. Ait. n. 10.—Leaves heart-shaped, nearly smooth, doubly toothed, somewhat lobed; the lower teeth turned towards the base. *Cluster* terminal, compound. *Bractæas* lanceolate. *Calyx* acute.—Native of the Altai mountains of Siberia. Introduced into our gardens by Mr. Hunnemann in 1786, where it proves a hardy perennial, flowering in May and June. The *stem* is furrowed, one or one and a half foot high, obscurely angular, scarcely branched. *Leaves* on long stalks, of a broad roundish-heart-shaped figure, with strong branching ribs, pliant, nearly smooth, somewhat sinuated, sharply toothed. *Flowers* pale yellow, or whitish, larger than the following, from which they are essentially distinguished by the lanceolate acute segments of their *calyx*.

14. *S. vernalis*. Yellow Fig-wort. Linn. Sp. Pl. 864. Willd. n. 14. Fl. Brit. n. 4. Engl. Bot. t. 567. Fl. Dan. t. 411. (*S. flore luteo*; Ger. Em. 717. Bauh. Prodr. 112. Riv. Monop. Irr. t. 107. f. 2. *S. montana maxima latifolia, flore luteo*; Barrel. Ic. t. 273.)—Leaves heart-shaped, doubly ferrated, downy. *Flower-stalks* axillary, solitary, forked, leafy. *Calyx* obtuse. Limb of the corolla minute.—Native of bushy places in Italy, Switzerland, and Germany, as well as in some parts of England, but rarely. It is biennial, flowering in April and May. *Stem* two feet, or more, in height, with four or five angles, in which latter case the *leaves* grow three together. They are stalked, broad, acute, pale green, copiously veined, most hairy

SCROPHULARIA.

hairy beneath. *Flower-stalks* all axillary, about as long as the leaves, bearing some small opposite serrated leaves, and a few lanceolate entire *bractæas*. *Flowers* numerous, pale yellow, with a large globose tube, contracted at the mouth, and a very minute limb, the length of whose segments is not nearly equal to the diameter of the tube. Segments of the *calyx* deep, elliptical, obtuse, downy, without any membranous border. A striking resemblance between the habit and flowers of this plant, and the Peruvian genus *Calceolaria*, is pointed out in English Botany.

15. *S. arguta*. Slender Upright Fig-wort. Ait. n. 12. Willd. n. 15.—Leaves heart-shaped, doubly serrated, smooth. *Flower-stalks* axillary, solitary, forked, leafless. *Bractæas* linear. *Calyx* obtuse. Limb of the corolla nearly equal to the tube.—Gathered by Mr. Maffon in Madeira and Teneriffe. An annual greenhouse plant at Kew, flowering in May and June. *Root* fibrous. *Stem* two feet high, erect, angular, smooth in the lower part. *Leaves* an inch or inch and half long, sharply and deeply serrated. *Flower-stalks*, and upper part of the stem, downy and rather viscid. *Flowers* small, red, their limb bearing its usual proportion to the tube. *Capful* ovate, pointed, as in the last, but scarcely half so large.

16. *S. trifoliata*. Three-leaved Axillary Fig-wort. Linn. Sp. Pl. 865. Willd. n. 16. Ait. n. 13. (*S. sambuci-folia*, flore rubro luteo vario pulchro; Griseb. Virid. Lust. 75. Pluk. Almag. 338. Phyt. t. 313. f. 6. *S. subrotundo crasso et nigricante folio*, flore luteo pallido, capfulâ turgidâ; Bocc. Mus. 65. t. 60. *S. indica*, capitulis maximis; Chabr. Ic. 472.)—Leaves smooth, roundish, coarsely serrated; the lower ones ternate. *Stalks* axillary, about three-flowered. Segments of the *calyx* orbicular, with a wavy membranous margin.—Native of Barbary, Corsica, and Portugal. A hardy biennial, sometimes met with in curious gardens, flowering in summer. *Stem* about a foot high, scarcely branched, leafy, nearly smooth, thick, with four blunt angles. *Leaves* opposite, stalked, fleshy and glaucous, about two inches long, and nearly as broad, bluntish, veiny; many of the upper ones quite simple; the rest accompanied each by a pair of smaller leaflets, more or less distinct or remote, at the top of the *foot-stalk*, which is about an inch long. *Flowers* all axillary, large, two or three on each stalk, which is shorter than the footstalk, rough, with glandular hairs, and bears several linear-lanceolate *bractæas*. *Calyx* glaucous, smooth, with peculiarly round, deep, broad-bordered segments. *Corolla* half an inch long, pale yellow, with an orange or rose-coloured limb.

17. *S. appendiculata*. Three-leaved Clustered Fig-wort. Jacq. Hort. Schonbr. v. 3. 19. t. 286. Willd. n. 5. (*S. lævigata*; Vahl. Symb. v. 2. 67. *S. trifoliata*; Desfont. Atlant. v. 2. 54.)—Leaves smooth, heart-shaped, doubly and bluntly serrated; the lower ones ternate. Clusters terminal, leafless, compound. Segments of the *calyx* orbicular, with a wavy membranous margin.—Native of the borders of fields, and the neighbourhood of the sea-shore, in Barbary. We gathered it in August 1786, in the royal garden at Paris, where it was raised from seeds brought by professor Desfontaines, but have not seen the plant in England. The *root* is said to be perennial. *Plant* entirely smooth, of a light glaucous green, larger than the last, to which it is most nearly akin, though essentially different; particularly in its racemose compound *inflorescence*, and heart-shaped, doubly toothed or serrated, *leaves*, with longer *footstalks*. The *flowers* are very similar.

18. *S. frutescens*. Shrubby Fig-wort. Linn. Sp. Pl. 866. Willd. n. 10. Ait. n. 9. (*S. lusitanica frutescens*, Vol. XXXII.

verbenacæ foliis; Tourn. Inst. 167. *S. peregrina frutescens*, foliis teucii crassiusculis; Herm. Lugd. Bat. 545. t. 547.)

β. Sm. Prodr. Fl. Græc. Sibth. n. 1459. (*S. heterophylla*; Willd. n. 12. *S. cretica frutescens*, folio vario crassiori; Tourn. Cor. 9.)

Leaves smooth, rather glaucous; the lower ones cut, lobed, or pinnate; the floral ones elliptic-lanceolate, entire. Cluster cylindrical; branches simply forked, racemose.—Native of Portugal, Barbary, and the Levant. Gathered by Dr. Sibthorp in Crete and Zante; the variety β on mount Athos. The *stem* is shrubby, two or three feet high, branched, angular, smooth, purplish, leafy. *Leaves* opposite, or partly alternate, coriaceous, smooth, of a deep glaucous hue, stalked; the upper ones most undivided, sharply serrated; the rest deeply cut, lobed, pinnatifid, or pinnate, in various degrees, and from one to four inches long. Cluster terminal, long, cylindrical, erect, with alternate branches, each of which is simply forked, its divisions racemose, bearing three or four alternate *flowers*; the stalks angular, roughish. *Bractæas* lanceolate. The lower part of the cluster, and some of its branches, are accompanied by elliptic-lanceolate, perfectly entire leaves, various in size. *Flowers* small, deep red; the tube rather paler than the limb. Segments of the *calyx* small, orbicular, smooth, with a brilliant white membranous edge.

19. *S. rupestris*. Rock Fig-wort. Willd. n. 11.—“Leaves oblong, stalked, toothed, nearly smooth. Cluster terminal. Stalks three-flowered.”—Gathered by the celebrated botanical traveller Marschall von Bieberstein, on the rocks of Taurida. Willdenow, to whom specimens were sent, says this plant is very nearly related to *S. frutescens*, of which it is perhaps only a variety; but it differs in having a *stem* only half a foot high, and very finely downy; *leaves* all stalked, more rigid, and of a smaller size; a terminal cluster, composed of three-cleft three-flowered stalks; and small, obtuse, not acute, *bractæas*.

20. *S. casia*. Sea-green Dwarf Fig-wort. Sm. Prodr. Fl. Græc. Sibth. n. 1460. Fl. Græc. t. 604, unpublished. (*S. orientalis minor*, melissæ folio; Tourn. Cor. 9? Buxb. Cent. 5. 10. t. 17. f. 2 ?)—Leaves smooth, rather glaucous, lyrato-pinnatifid, cut. Stems numerous. Cluster short; branches two or three-flowered.—Gathered by Dr. Sibthorp on rocks about Athens and Messena; as well as in Laconia. The *root* is perennial, thick and woody. *Stems* very numerous, somewhat shrubby at the base, spreading in all directions, a span high, leafy, scarcely branched but at the bottom, bluntly quadrangular, smooth. *Leaves* opposite, stalked, an inch and half long, sharply cut and toothed, of three principal lobes, one of them very large and pinnatifid, the others smaller, besides one or two very small ones below, mostly entire. Cluster or panicle two or three inches long, with entire oblong *bractæas*; its branches opposite, simply forked, their lateral branches single-flowered, and one of them often deficient. Segments of the *calyx* orbicular, smooth, with a white membranous edge. Tube of the *corolla* inflated, greenish, brown on the upper side; two larger segments of the limb chocolate-coloured, the rest greenish-white. We can but guess at the synonyms. The *leaves* are not much like balm, *Melissa*. Buxbaum's rude figure is not unsuitable to our plant.

21. *S. sambucifolia*. Elder-leaved Fig-wort. Linn. Sp. Pl. 865. Willd. n. 17. Ait. n. 14. Mill. Ic. t. 231. (*Sideritis sambucifolia*; Alpin. Exot. 203. t. 202.)

β. *S. mellifera*; Ait. n. 15. Desfont. Atlant. v. 2. 53. t. 143. Willd. n. 18. Vahl. Symb. v. 2. 68.

Lower leaves interruptedly pinnate; upper ternate; leaflets

SCROPHULARIA.

leaflets heart-shaped, ferrated, smooth; unequal at the base. Flower-stalks axillary, slightly branched.—Native of the south of Europe, Barbary, and the Levant, in sandy ground. The roots are tuberous, according to Alpinus, perennial, but subject to rot in a garden soil. Herb thick, smooth, succulent, of a light glaucous green. Leaves opposite, or somewhat alternate, irregularly, more or less sharply, ferrated, varying much in size and bluntness. Flowers very large, axillary, drooping; their stalks usually shorter than the footstalks, simple, divided, or forked; sometimes elongated towards the upper part of the branch, and the leaves being occasionally contracted, or wanting, there, the inflorescence becomes racemose. Calyx smooth, or slightly downy; segments orbicular, with a membranous edge. Corolla of a pale purplish tawny hue, with a greenish limb. Capsule as big as a small filberd, with a conical point.

We can find no decisive character between the two plants of authors, which we have here combined. The leaflets of β are commonly more rounded or obtuse, but a comparison of the figures of Miller and Desfontaines will shew that there is no difference in their inflorescence. A specimen from Barbary, given us by the botanist last mentioned, is *sambucifolia*, which not being mentioned in his work, he plainly did not distinguish from his *mellifera*. Those who have mentioned these two supposed species, have not contrasted them with each other, nor have we had an opportunity of comparing them in a living state; but it is to be presumed the same honey-bearing glands are to be found in the bottom of the corolla of each, they being in every other respect so much alike.

22. *S. hispida*. Hispid Fig-wort. Desfont. Atlant. v. 2. 55. Willd. n. 19. "Stem square, erect, hispid. Leaves villous, pinnate, doubly crenate; the terminal lobe heart-shaped, very large. Cluster compound, leafless."—Native of the clefts of rocks on mount Atlas, near Tlemcen. Root perennial. Stem erect, firm, slightly branched, about two feet high, hispid with very abundant short hairs. Leaves opposite, on short stalks, two to three inches long, and above half as broad, villous, soft and hoary, of a few small ovate leaflets, often cut away at the upper edge, besides the large, sometimes lobed, terminal one. Cluster terminal, six or eight inches long; its branches opposite or alternate, subdivided, hairy. Bractæas linear. Calyx smooth, with rounded membranous-edged segments. Corolla the size of *S. nodosa*. Desfontaines.

23. *S. canina*. Wing-leaved Fig-wort, or Dog's Rue. Linn. Sp. Pl. 865. Willd. n. 20. Ait. n. 16. Sm. Fl. Græc. Sibth. t. 598, unpublished. (S. n. 328; Hall. Hist. v. 1. 142. Ruta canina; Clus. Hist. v. 2. 209. Ger. Em. 1256.)—Leaves pinnate; leaflets decurrent, cut. Stem round. Cluster leafless; its branches simply forked, their divisions racemose. Flowers nearly sessile, without an internal lobe.—Native of Switzerland, France, Italy, and the Levant; frequent in Greece, Crete, and Cyprus. A hardy annual, long known in botanic gardens, but not generally cultivated, flowering most part of the summer. Root rather woody. Stems two or three feet high, slightly angular, purplish, smooth, leafy. Leaves dark green, smooth, opposite or alternate, stalked; leaflets deeply cut, or pinnatifid, sometimes accompanied by small intermediate ones. Clusters one or more, terminal; sometimes leafy at the bottom, but for the most part furnished throughout with lanceolate bractæas only; their branches alternate, simply forked, with a flower in the fork, the two divisions simply racemose, or rather spiked, varying greatly (from three to ten) in the number of their flowers, which are alternate, almost sessile, each subtended by a small bractæa, and accompanied by a larger one,

on the opposite side of the stalk. The white membranous border of the calyx is very conspicuous. Corolla about the size and shape of *S. aquatica*, but destitute of an intermediate lobe; its tube yellowish-green; two larger segments of the limb blood-red; two lateral ones orange; odd one green.—Willdenow refers to this, as a variety, *S. orientalis*, *chrysanthemi folio*, flore minimo atropurpureo; Tourn. Cor. 9, which he supposes may be *S. lucida* of Pallas. We have no knowledge of Tournefort's plant, but, from its place in his work, it should seem to be very nearly related to our *S. bicolor* hereafter described, or perhaps a variety of that species.

24. *S. variegata*. Spotted-flowered Fig-wort. Marsch. von Bieberst. in Sims and Kon. Ann. of Bot. v. 2. 445. Willd. n. 22.—"Stems shrubby at the base. Leaves bipinnatifid, downy. Clusters elongated; flower-stalks short, rough, with hooked hairs."—Native of the stony banks of rivers, and barren hills, between the rivers Terek and Kur, in the neighbourhood of the Caspian sea, flowering in June and July. The root is perennial. Stem woody at the base, with numerous long slender branches, clothed, like all the rest of the herbage, with rough hairs. Flowers rather less than in *S. canina*. Corolla purplish; its two upper segments short, obtuse, incumbent, one of them marked with a white spot; three lower ones white, very small, obtuse. Akin to the last, but, according to this description, sufficiently distinct.

25. *S. lucida*. Shining-leaved Fig-wort. Linn. Sp. Pl. 865. Willd. n. 21. "Hort. Berlin. t. 57." Ait. n. 17. Sm. Fl. Græc. Sibth. t. 599, unpublished. (*S. saxatilis lucida*, *laferpitii massiliensis foliis*; Tourn. Inst. 167. Bocc. Mus. 166. t. 117. *S. indica*; Ger. Em. 716? *S. glauco folio*, in amplas lacinias diviso; Tourn. Cor. 9. Voy. v. 1. 84, with a plate.)—Leaves pinnate, fleshy, smooth; leaflets pinnatifid, decurrent, cut. Stem round. Cluster leafless; its branches forked, cymose. Flowers stalked; without an intermediate lobe.—Native of Italy and the Levant; common in the islands of the Archipelago. The root is woody, and said to be perennial. It is not easy to distinguish this species, by description, from the *canina*, except that the leaves appear to be more glaucous, and the cluster of flowers altogether more cylindrical, with shorter compact branches, of a cymose habit, the flowers all stalked. The four uppermost segments of the corolla are all of one nearly uniform blood-red, (without any intermediate lobe,) the odd one green. Capsule nearly twice the size of *canina*. Linnæus quotes the plant of Tournefort's Voyage as the same with what that writer had previously mentioned, by another name, in his *Institutiones*. Dr. Sibthorp's exactly answers to the plate of Tournefort, and is drawn with leaves more glaucous than *canina*.

26. *S. filicifolia*. Fern-leaved Fig-wort. Mill. Dict. ed. 8. n. 10. Sm. Prodr. Fl. Græc. Sibth. n. 1456. Fl. Græc. t. 600, unpublished. (*S. foliis filicis modo laciniatis*, vel *ruta canina latifolia*; Tourn. Inst. 167.)—Leaves pinnate; leaflets pinnatifid, decurrent, cut; in the lowest leaves obovate. Stem square. Cluster leafless; its branches forked, divaricated, with from five to nine flowers. Corolla with an intermediate lobe.—Native of Crete. A large tall species, with dark-green leaves, of which the lowermost are a foot long, with broad, obovate, lobed, cut, decurrent leaflets. It is readily distinguished from *S. canina*, *lucida*, and their allies, by the squareness of its stem, to the very top of the cluster, and the presence of an intermediate lobe to the corolla; the two upper segments of whose limb are of a peculiarly dark red, or chocolate colour; the lateral segments, like the lobe just mentioned, of a pale red; the lower one green,

green, and very small. The *flowers* are all nearly sessile; nine on the lowest branches of the cluster, seven on those about the middle; five or three on the uppermost. *Calyx* with a white membranous edge, as in all this tribe.

27. *S. livida*. Livid Fig-wort. Sm. Prodr. Fl. Græc. Sibth. n. 1457. Fl. Græc. t. 601, unpublished.—Leaves pinnate; leaflets pinnatifid, decurrent, angular and cut, all uniform. Stem square. Cluster leafless, straight; its branches forked, with from three to seven flowers. Corolla with an intermediate lobe.—Gathered by Dr. Sibthorp in Asia Minor, probably near Smyrna. This appears to be annual, and differs from the last in the uniformity, lighter colour, and smaller size, of its *leaves*, whose segments are small, wedge-shaped, angular and channelled. The *inflorescence* is similar, but more slender and condensed. Two upper segments, and intermediate lobe, of the *corolla* pale purple, or lilac-coloured; lateral and lower ones, like the tube, of a light green.

28. *S. bicolor*. Striped-flowered Fig-wort. Sm. Prodr. Fl. Græc. Sibth. n. 1458. Fl. Græc. t. 602, unpublished. (*S. chrysanthemifolia*; Marfch. von Bieberit. in Sims and Kon. Ann. of Bot. v. 2. 446? *S. orientalis*, *chrysanthemi folio*, flore minimo variegato; Tourn. Cor. 9.)—Leaves bipinnate, narrow, sharply cut. Stem round. Cluster leafless; its branches simply forked, their divisions racemose. Flowers stalked, without an intermediate lobe.—Native of Sicily and the Levant. A tall, branching, paniced species, with very narrow, smooth, shining *leaves*, whose segments are sharply cut and pointed. The *inflorescence* forms a large compound panicle, with numerous lanceolate *bractæas*. *Calyx* elegantly bordered with a purple line, within its white marginal membrane. The two upper, as well as the lowest, lobes of the *corolla* are of a blood-red, edged with white, the two lateral ones pure white; tube blood-red, pale at the base. We have little doubt of Tournefort's synonym, which is so very apposite in character; respecting that of Von Bieberstein, we are more doubtful. The present elegant species is less naturally allied to the two last, than to some of those immediately preceding them; but its *leaves* are more finely divided than in any other known *Scrophularia*.

The whole genus is more or less fœtid when bruised, and of a noxious quality to most of the larger animals.

SCROPHULARIA, in *Gardening*, comprises plants of the fibrous-rooted, herbaceous, and shrubby kinds, of which the species cultivated are, the shrubby fig-wort (*S. frutescens*); the three-leaved fig-wort (*S. trifoliata*); the elder-leaved fig-wort (*S. sambucifolia*); and the shining-leaved fig-wort (*S. lucida*).

Method of Culture.—These plants may be increased by seeds, which should be sown in autumn in the borders or other places where the plants are to remain. The plants should be kept free from weeds; when the roots continue several years, unless destroyed by severe frosts. It is therefore a good practice to have some in pots protected by a frame and glasses: and as the young plants flower the strongest, a proper succession should be sown annually. They may also be sometimes raised from the parted roots; and the shrubby sorts by cuttings or slips in the summer or spring months.

They afford ornament and variety in the clumps and borders, as well as other parts, of pleasure grounds: also when set out among collections, in pots.

SCROPHULARIÆ, in *Botany*, a natural order of plants, named from one of the most remarkable and best-known genera, see SCROPHULARIA; making the fortieth

order in Jussieu's system, or the seventh of his eighth class; see LABIATÆ and GENTIANÆ. See also PERSONATÆ, a Linnæan order, to which that under consideration is, in a great part, parallel. The character of the *Scrophulariæ* is thus given by Jussieu.

Calyx divided; often permanent. *Corolla* often irregular; divided in the limb. *Stamens* often four, two longer than the others; rarely only two in all. *Style* one; stigma simple or two-lobed. *Fruit* capsular, of two cells, split at the summit, if not completely separated, into two valves, which are in some few instances divided again into two parts; their inside is naked and concave, with a central receptacle, bordered vertically all round, and bearing seeds at each side, supplying the place of a partition, being parallel to the valves, and often connected, in its whole circumference, with their margins. *Seeds* often numerous and minute. *Stem* herbaceous, rarely shrubby. *Leaves* opposite or alternate. *Flowers* bracteated.

Section 1. *Stamens four, two longer and two shorter*.

Buddleia; *Scoparia*; *Ruffelia* of Jacquin; *Capraria*; *Stemodia*; *Halleria*; *Galvezia* of Dombey; *Achimenes* of Browne; *Scrophularia*; *Matourea* of Aublet, suspected by Schreber to be a *Vandellia*; *Dodartia*; *Gerardia*; *Cymbaria*; *Linaria* of Tournefort; *Antirrhinum*, comprehending *Asarina* of Tournefort; *Hemimeris*; and *Digitalis*.

Section 2. *Stamens two*.

Pæderota; *Calceolaria*; and *Bæa* of Commerçon.

Section 3. *Genera akin to Scrophulariæ, with opposite leaves*.

Columnnea; *Besleria*; *Cyrtandra* of Forster; *Gratiola*; *Torenia*; *Vandellia*; *Lindernia*; *Mimulus*; *Polypremum*; and *Montira* of Aublet.

Section 4. *Genera akin to Scrophularia, with alternate leaves*.

Schwalbea; *Schwenkia*; and *Browallia*.

SCROPHULOUS TUMOURS, in *Hogs*, swellings of the glands about the necks and other parts of them, arising from colds and obstructions caused in other ways. They may mostly be removed by mild camphorated mercurial ointments, used two or three times in the day to the diseased parts. See HOG and SWINE.

SCROTOCELE, in *Surgery*, a hernia, or rupture, which has descended into the scrotum.

SCROTUM, in *Anatomy*, the bag of skin which contains the testicles. See GENERATION.

SCROWLS, or SCROLLS, in *Architecture*. See VOLUTE.

SCRUB, in *Geography*, one of the smaller Virgin islands, in the West Indies.

SCRUPI, in *Natural History*, the name of a class of fossils, formed in detached masses, without any crusts; of no determinate figure, or regular structure; and composed of a crystalline or sparry matter, debased by an admixture of earth, in various proportions.

Under this class are comprehended, 1. The telaugia. 2. The petridia. 3. The lithozugia. 4. The jaspides, or jaspers.

All these genera strike fire with steel, only some more readily than others.

SCRUPLE, SCRUPULUS, *Scrupulum*, or *Scripulum*, the least of the weights used by the ancients, which, amongst the Romans, was the twenty-fourth part of an ounce, or the third part of a drachm.

SCRUPLE is still a weight among us, containing the third part of a drachm, or twenty grains.

Among goldsmiths the scruple is twenty-four grains.

SCRUPLE, in *Chronology*. The Chaldee scruple is $\frac{1}{16}$ part

part of an hour, called by the Hebrews *belakin*. These scruples are much used by the Jews, Arabs, and other eastern people, in computations of time.

SCRUPLES, in *Astronomy*. *Scruples eclipsed*, that part of the moon's diameter which enters the shadow, expressed in the same measure in which the diameter of the moon is expressed. See **DIGIT**.

SCRUPLES of Half Duration, an arc of the moon's orbit, which the moon's centre describes from the beginning of an eclipse to its middle.

SCRUPLES of Immersion, or *Incidence*, an arc of the moon's orbit, which her centre describes from the beginning of the eclipse, to the time when its centre falls into the shadow. See **IMMERSION**.

SCRUPLES of Emerſion, an arc of the moon's orbit, which her centre describes in the time from the first emerſion of the moon's limb, to the end of the eclipse.

SCRUTATOIRES, among the Romans, certain officers, or servants, whose business it was to search every body that came to salute the emperor, in order to discover if they had any kind of arms concealed about them. They were first instituted under the emperor Claudius.

SCRUTINY, **SCRUTINIUM**, in *Antiquity*, an examination, or probation, practised in the last week of Lent, on the catechumens, who were to receive baptism on the Easter-day.

The scrutiny was performed with a great many ceremonies: exorcisms and prayers were made over the heads of the catechumens. On Palm Sunday, the Lord's prayer and Creed were given them, which they were afterwards made to rehearse.

The process was called *scrutinium*, scrutiny; because hereby the hearts of the catechumens were scrutinized, or searched, that the priests might understand who were fit to be admitted to baptism.

This custom was more in use in the church of Rome than any where else; though it appears, by some missals, to have been likewise used, though much later, in the Gallican church. It is supposed to have ceased about the year 860. Some traces of this practice still remain at Vienne, in Dauphine, and at Liege.

SCRUTINY is also used, in the *Canon Law*, for a ticket, or little paper billet, wherein, at elections, the electors write their votes privately, so as it may not be known for whom they vote.

SCRUTINY, among us, is chiefly used for a strict perusal and examination of the several votes hastily taken at an election; in order to find out any irregularities committed therein, by unqualified voters, &c.

SCRUTORE, or **SCRUTOIR** (from the French *escritoire*) a kind of cabinet, with a door or lid opening downwards, for conveniency of writing on, &c.

SCRY, in *Falconry*, denotes a large flock of fowl.

SCUD, in *Agriculture*, a term used provincially to signify to clear with a spade or spittle.

SCUD, in *Sea Language*, a name given by seamen to the lowest and lightest clouds, which are most swiftly wafted along the atmosphere by the wind.

SCUDDING, the movement by which a ship is carried with great velocity before a tempest.

As a ship moves through the water with so great a velocity whenever this expedient is put in practice, it is never attempted in a contrary wind, unless when her condition renders her incapable of sustaining the mutual efforts of the wind and waves any longer on her side, without being exposed to the most imminent danger. See **TRYING**.

A ship either scuds with a sail extended on her fore-mast,

or, if the storm is violent, without any sail; which in the seaphrase is called scudding under *bare-poles*. In sloops and schooners, and other small vessels, the sail used for this purpose is the square-sail. In large ships, it is either the fore-sail with or without a reef, or *goose-winged* only, according to the degree of the tempest; or it is the fore-top-sail close reefed, and lowered on the *cap*: which last is particularly used when the sea runs so high as to becalm the fore-sail occasionally, a circumstance which exposes the ship to the danger of *broaching-to*.

The principal hazards incident to scudding are, generally, a *pooping* sea; the difficulty of steering, which exposes the vessel perpetually to the risk of *broaching-to*; and the want of sufficient sea-room. A violent pooping sea may dash in the stern or quarter, and cause the vessel to founder. In *broaching-to* suddenly, she is threatened with being immediately overſet; and for want of sea-room, she is endangered by shipwreck on a lee-shore, a circumstance too dreadful to require explanation.

SCUDENES, or **SCUTENESS**, in *Geography*, an island near the coast of Norway, about 20 miles in circumference; 18 miles N.W. of Stavanger.

SCUDERI, **GEORGE DE**, in *Biography*, was born at Havre de Grace in 1601, of an ancient family, originally from Provence. According to his own account he passed his youth in military service, and in travels through the greater part of Europe, but he was not known till he settled at Paris in the capacity of a writer, and in this capacity he had a most prolific pen, giving to the world plays, poems, essays, &c. in great abundance. Most of his works are sunk in oblivion. His "*Alaric ou Rome Vaincue*," has been ranked in the same class with the "*Pucelle*" of Chapelain. His "*Observations sur le Cid*" obtained for the author the favour of cardinal Richelieu. Scuderi obtained admission into the French Academy, and he had also the gift of a petty government in Provence, but he was scarcely able to keep himself above a state of indigence. He died at Paris in 1667.

SCUDERI, **MAGDALEN DE**, sister of the preceding, born at Havre de Grace in 1607, was educated at Paris, and at an early age was admitted at the Hotel de Rombouillet, where she was encouraged to enter the career of an authoress: she soon shewed that she possessed qualities of the heart and understanding, which procured her many friends of rank and distinction. She was particularly celebrated as a writer of romance. Some of her works consist of ten volumes. They were much read when they first appeared, though they have long since declined in reputation. They are said, however, to contain some elegant writing, and much real elevation and dignity of sentiment, which did great honour to the writer. Their popularity was much augmented, as they were supposed to exhibit portraits of many of the most distinguished characters of the French court at that period. Her "*Conversations et Entretiens*," are by some accounted her most valuable publication, though the politeness inculcated in them would now appear formal and tiresome. Madame de Scuderi carried into practical life the warmth of attachment and honourable sentiments which her works displayed, and she even dared to manifest her friendship for Pellison when he was confined in the Bastille. She was in habits of correspondence with some of the most distinguished literary characters of Europe; was elected a member of the academy of Ricovrati at Padua; was patronized by cardinal Mazarin and Louis XIV.; and admitted to the friendship of queen Christina. She died in 1701, at the age of 94. Moreri.

. SCUDERI,

SCUDERI, in *Geography*, a mountain of Sicily, in the valley of Demona, 10 miles S.W. of Messina. Next to Etna, this is the highest mountain in Sicily, and retains snow all the year.

SCUDO, in *Commerce*, a money of account, and also a silver coin, in different parts of Italy, in Sicily, and also at Malta. At Rome, accounts are kept in crowns or scudi, called scudi romani, and scudi moneta; each scudo being divided into 10 paoli or giuli, and each paolo into 10 bajocchi. The scudo is likewise divided into $3\frac{1}{2}$ testoni, 500 quattrini, or 1000 mezzi quattrini: so that 5 quattrini make 1 paolo, and 3 paoli 1 testone. The scudo di stampa d'oro, by which many of the foreign exchanges are regulated, is reckoned at 1523 or 1525 mezzi quattrini; that is, when a bill is drawn from Rome on a foreign place, the scudo di stampa d'oro is reckoned at 1523 mezzi quattrini; but when drawn from another place on Rome, it is reckoned at 1525 ditto: this scudo is divided into 20 foldi, or 240 denari. Among the silver coins are scudi romani, and half ditto. The scudo weighs 22 denari $10\frac{7}{10}$ grains, Roman weight, or $408\frac{1}{10}$ English grains; and the silver is $10\frac{3}{4}$ ounces fine in the lb.; it therefore contains 403 grains of English standard silver, and is worth 4s. 4d. sterling. The scudo di stampa d'oro, of 1523 mezzi quattrini, is worth 6s. $7\frac{1}{4}$ d. sterling; and the paoli, $5\frac{1}{4}$ d. sterling nearly; or 1l. sterling = 4 scudi 62 bajocchi, all valued in silver. All payments above 5 scudi are made in cedole, or schedules, a sort of bank notes, which cannot be refused in payment, and which are constantly at a discount. At Malta, accounts are kept in scudi of 12 tari, each taro being subdivided into 2 carlini, 20 grani, or 120 piccioli. These monies of account are valued in silver and copper money, silver money being to copper money as 3 to 2. At Mantua, a scudo of account is 6 lire, or 120 foldi. At Milan, a scudo di cambio, or imperiale, is reckoned at 5 lire 17 foldi, or 117 foldi imperiali; a scudo corrente at 5 lire 15 foldi, or 115 foldi correnti: 1219 scudi imperiali are equivalent to 1755 scudi correnti. Among the silver coins are scudi of 18 denari $21\frac{1}{2}$ grani, at 6 lire, and halves in proportion. In copper the scudi are about 10 denari 18 grani (or 10 oz. 15 dwts.) fine; but the lire are only 6 denari 14 grani (or 6 oz. $11\frac{1}{2}$ dwts.) fine. The scudo imperiale is worth 5s. $2\frac{1}{2}$ d., and the scudo corrente 3s. $7\frac{1}{2}$ d. If valued in gold, the scudo corrente is worth 3s. $6\frac{3}{4}$ d. sterling. According to the mint price of gold and silver in England, viz. 3l. 17s. $10\frac{1}{2}$ d. per ounce for gold, and 5s. 2d. per ounce for silver, the scudo of 7 lire at Bergamo is 35^d.67 in silver, and 36^d.50 in gold:—At Florence the scudo d'oro, or gold crown, is 63^d.97 in gold:—at Genoa, the scudo di cambio, or crown of exchange, is worth 36^d.75 in silver, and 36^d.02 in gold; and the scudo d'oro marche 85^d.49 in silver, and 83^d.77 in gold:—at Lucca, the scudo d'oro is 55^d.50 in silver, and 58^d.27 in gold; the scudo corrente 51^d.80 in silver, and 54^d.39 in gold:—at Malta, the scudo, or crown, is 21^d.32 in silver, and 23^d.34 in gold:—at Milan, the scudo imperiale is 60^d.90 in silver, and 61^d.60 in gold; and the scudo corrente 42^d.32 in silver, and 42^d.78 in gold:—at Novi, the scudo d'oro marche is 85^d.49 in silver, and 83^d.77 in gold:—at Rome, the scudo, or crown, is 52^d.05 in silver, and 51^d.63 in gold; and the scudo di stampa d'oro 79^d.37 in silver, and 78^d.73 in gold:—at Sicily, the scudo, or crown, is 49^d.02 in silver, and 49^d.92 in gold. For the assay, value, &c. of the scudo, see the table under COIN. For the impressions on the scudo, and other particulars, we refer to Kelly's Universal Cambist.

SCUFFLE, or **SCUFFLER**, in *Agriculture*, an implement of somewhat the same kind as the scarifier, but which is

mostly lighter, and employed in working after it. There is a great variety of these sorts of implements described in works on agriculture. The following have been found to perform the work well in actual practice. It is noticed, that a tool of this sort, invented in Norfolk, has been found highly useful in that district. It is described in the Agricultural Survey of the above county as being formed from a double-breasted foot-plough, by taking off the breasts, and having a share larger and flatter than the original one made. To the end of the beam of the plough, a cross-beam of wood, three feet long, four inches broad, and four inches thick, is fastened; and at the distance of twelve inches and a half each way from the centre of this cross-beam, are inserted two coulter, each twelve inches long, three inches broad, and a quarter of an inch thick on the back, but reduced to three-eighths in the front; and into these coulters, at the bottom, are rivetted two shares, of nearly the same size as the first share, which was nine inches broad, but these two only eight inches. The cross-beam is strengthened by two iron reins fixed to the cross-beam, and also to the beam of the plough, in the best manner for the purpose.

It may also be noticed, that the coulters which are fixed to the cross-beam do not stand perpendicularly; but inclining, as the coulters at the head of the plough: thus they are fixed into a cross-beam by means of a screw and a nut, so as to keep them quite fast and steady.

The advantage of this scuffler above any that the inventor has seen is, that it is used with two horses only. It does the work of more than two ploughs, as the three shares cut nearly the width of thirty inches, whereas two ploughs would cut only twenty-four inches. It is used on farms which consist of heavy land, as well as land of a mixed soil. But a scuffle recommended by Mr. Amos is occasionally much in use; which has wheels on which it is carried from one field to another, and by which the depth of working is regulated. These wheels turn round upon their axles, and also upon the under end of the upright shank, in imitation of bed-casters. The middle beams are the parts to which the horses are fixed; but there are likewise side-beams; and the shanks of the shares are fixed in the beams by nuts and screws. They are fifteen inches long below the beams, and made of iron, one inch and a half by half an inch square: they are rivetted on their shanks. The handles for managing the machine are about four feet three inches long.

This implement is said to be of great utility in cleaning bean and pea stubbles, in order to their being sown with wheat. And it is very advantageous in destroying weeds upon fallows, where ploughing might be injurious, either on account of the land being too moist or very light in its quality. It is likewise admirably adapted to the cleaning of land that has been sown with the garden pea, in order to its being ploughed, harrowed, rolled, and drilled with turnips or rape-feed in the latter end of summer, at the beginning of August.

And with this tool it is asserted that one man and two horses are capable of scuffling six or eight acres per day. It is advised, that after the land is scuffled over, it should be harrowed twice or three times in a place, and the weeds collected and destroyed. But it has been made an objection to these sorts of tools with some, that they cannot be made to operate in a beneficial manner, except where the land has been previously brought into a fine condition, and rendered clear from weeds. These, as well as scarifying implements, are likewise liable to objection from their being subject to clog much when the lands are wet. A tool of this sort has however been employed in the midland districts, which is said to be in a great measure free from the

the last objection. It has been recommended by Mr. Bower. In this tool, by the teeth being only twelve inches from each other, and their intersecting, that distance is reduced to six inches, where the breadth of the shares, from being full three inches, afford another reduction, which brings them so near together, that the land is almost wholly broken and reduced, and the intention of a ploughing as well as a harrowing accomplished at once, without cutting the roots of the couch-grass in two, which is a great superiority that it possesses over the plough. And from the teeth bending forward, and having that kind of position, the roots are brought to the top more perfectly, which is another superiority over the plough. It has also much superiority in the dispatch of work, four horses and a man being able to finish six acres or more of land of a sandy quality in the course of a day. And the following are the dimensions of this tool. The length of the first bull is four feet and a half; and the length of the second bull three feet nine inches. The teeth are two feet in length, and bent near the bottom, in order that they may lie flat on the earth. The length of the beam is six feet. And the length of the iron axle-tree, for the small wheels, is one foot and a half. The length of the iron that shifts through the beam, and fastens with a screw, is two feet.

Many other light tools of the same description have been lately provided by different implement-makers in different parts of the country, which are well fitted for particular uses in the cultivation of land, and which, by their convenience and modes of working, save much labour and expence. They are some of them made with two rows of shares, five and four in each, about six inches in breadth; the front ones cutting the interspaces of the hinder ones, by which means the work is done in an excellent manner. The depth of working is regulated by small wheels that let up and down. They prepare bean and other stubbles admirably for wheat or any other crops. They are a sort of tool which is fast getting into general use by the farmer.

SCUFFLING in Crops, the practice of putting them into the soil or ground by means of the tool called the scuffle. It is a practice which has lately been much had recourse to in some heavy, moist, land districts with great utility and advantage, and it may probably be employed in almost every sort with considerable benefit, as much time and labour, in the busy period of the spring, may thereby be saved; as the ploughing being performed in the leisure season of the autumn, the seed can readily be put into the ground by the operation of scuffling in the early spring months. In all cases where the state of the weather, and the lands that have been ploughed for a barley fallow, or other purpose, will not let that grain be put into the grounds early in the spring, this may be a good method of proceeding, as further ploughing, in such circumstances, would be highly dangerous and improper. Such fallows, or other ploughings, having had the full effect of the frosts, and the influence of the atmosphere during the whole of the winter season, cannot but be well fitted for the operation of scuffling at this period, and by that means being made fit for putting in the seed. The same will frequently be the case with all other lands which have been ploughed before the commencement of the winter season; such as those of the tare, bean, and pea stubble kinds, as well as those turnip-lands which have been cleared and ploughed at an early period, and this method of preparing them for, and putting in, the seed, may be had recourse to with great safety and advantage. There is no danger in this way of destroying the fine surface pulverization and tilth which is so essentially necessary for the reception of the seed, as is often

done by the use of the plough under such wet and unfavourable circumstances of tillage lands. See **SCARIFYING**, and **TILLAGE**.

The working of the surface soil in this manner, and the relinquishing of the use of the plough in some measure, is a great modern improvement in the tillage system, which is most fully practised in Suffolk; but it is fast coming into use in other districts. In Essex some farmers find it a more effectual and cheaper method of cleaning fallows than that of trusting wholly to the plough. It is also found useful in cleaning land for turnips, as well as in lightening the ground in fly-eaten crops of that sort.

SCULCOATS, in *Geography*. See **HULL**.

SCULION, in *Ichthyology*, a name given by Aristotle, and many others of the ancient writers, to the fish called by later authors *catulus*, and *catulus major*, and in England the *bounce*.

SCULK, among *Hunters*, denotes a company; as, a culk of foxes.

SCULL. See **SKULL**.

SCULL-CAp, in *Gardening*, the common name of a curious garden plant. See **SCUTELLARIA**.

SCULPONEÆ, among the Romans, a kind of shoes worn by slaves of both sexes. These shoes were only blocks of wood made hollow, like the French *sabots*.

SCULPTURE, *English*, is from the Latin, *sculptura*; and the verb *sculpo*, I carve or engrave, which is the same as the Greek *Γλυφω*: therefore basso-relievo was called *anaglyphis* in that language; which word was also understood for carved representations in general. The Greeks had other words by which they signified particular works of sculpture; as *Εικωνες*, *images*; and *τυποι*, *types*, or *representations in relief*.

Sculpture is the art of imitating visible form by means of solid substances, either modelled, as clay or wax, or carved, as marble. The principles of sculpture and of painting are both the same; till painting divides itself into a distinct branch by the imitation of colour; while sculpture is expressed by form alone.

Of Hebrew Sculpture.—As the bible is the most ancient history we possess, those instances of the arts of design which are mentioned in that sacred volume ought to be noticed, and particularly of sculpture.

The first mention of images is in Genesis; where Rachel stole her father's gods, which are called Teraphim, or images. Mention is made also in Genesis of Judah's signet.

In Exodus, Moses receives commands and instructions concerning the tabernacle; that he should cause it to be made according to the pattern which was shewed him on the Mount. And in order to this, Bezaleel and Aholiab are inspired with the spirit of God "to devise cunning works in gold, and in silver, and in brass, and in cutting of stones, and in carving of timber to work all manner of workmanship."

The importance of the arts of design is here particularly demonstrated by the manner in which Bezaleel and Aholiab are called, even in the service of religion; and filled with the divine spirit for their employment in the Tabernacle and the Ark of the Covenant, as described in the following passage by Moses.

"And Moses said unto the children of Israel, see, the Lord hath called by name Bezaleel, the son of Uri, the son of Hur, of the tribe of Judah. And he hath filled him with the spirit of God in wisdom, in understanding, and in knowledge, and in all manner of workmanship. And to devise curious works in gold, and in silver, and in brass. And in the cutting of stones, to set them, and in carving of wood, to make any manner of cunning work. And he hath put it

SCULPTURE.

it on his heart, that he may teach, both he and Aholiab, the son of Ahisamach, of the tribe of Dan. Them hath he filled with wisdom of heart, to work all manner of work of the engraver, and of the cunning workman, and of the embroiderer in blue, and in purple, and in scarlet, and in fine linen; and of the weaver, even of them that do any work, and of those that devise cunning work."

Such inspired works being ordained, and Moses coming down from the Mount to cause all to be performed according to the divine will; he finds that the people have made a golden calf, crying out, "These are thy gods, O Israel, who brought thee out of the land of Egypt." The golden calf is evidently the Egyptian Orus or Apis.

The manner of making the golden calf is thus described by Aaron: "I said unto them, whosoever hath any gold let them break it off; so they gave it me; then I cast it into the fire, and out came this calf." It is also said, "He received the earrings and gold at their hand, and fashioned it with a graving tool after he had made a molten calf."

This dreadful attempt to annihilate inspired art at its birth, is visited by a grievous judgment, but no more grievous than is necessary to its security: for this deliverance from Egypt was the deliverance of man, both as to his bodily and mental faculties, from slavery.

When the tables of stone are renewed, that they may be deposited in the ark, Moses, Bezaleel, and Aholiab, and every wife-hearted man, in whom the Lord had put wisdom and understanding, set about their inspired work.

The tabernacle and its curtains and cherubim; the veil and its cherubim; the ark and mercy-seat and their cherubim; the table of show-bread and the golden candlestick; the altar of burnt-offerings, and the altar of incense; the laver; the garments of Aaron, and his breast-plate and mitre and holy crown, and the garments of the sons of Aaron.

Whether the cherubims which were woven in the curtains and the veil are to be considered simply as mentioned in Exodus; or, according to the more expanded and poetical representations in Ezekiel, accompanied by their dreadful wheels, containing Orion and Pleiades, Mazzaroth and his sons, Arcturus and the chambers of the south, as mentioned in Job, Isaiah, and Amos; like the representations on our celestial globe, the difference will be only in their more or less splendid design and embroidery. But the description is more positive concerning those sculptured cherubims which covered the ark of the testimony.

"And he made the mercy-seat of pure gold. Two cubits and a half was the length thereof, and one cubit and a half the breadth thereof. And he made two cherubims of gold; beaten out of one piece, made he them on the two ends of the mercy-seat. One cherub on the end on this side; and another cherub on the other end on that side: out of the mercy-seat made he the cherubims on the two ends thereof. And the cherubims spread out their wings on high, and covered with their wings over the mercy-seat; with their faces one to another; even to the mercy-seat were the faces of the cherubims."

These figures, as also the candlestick and table, and all other works of sculpture contained in the tabernacle; together with Aaron's breast-plate, a span each way, four-square; containing twelve precious stones, each engraved with the engraving of a signet, with the names of the children of Israel; must have been worthy of their divine author.

And the necessity of such inspired sculptures and other inspired works of art is explained sufficiently in the deliverance of Israel from the idolatry of Egypt; where no one

dared to practise any art or science, but that of his fathers; who, like him, were kept from every indication of individual character. And the Hebrew being born a slave, continued so while under the Egyptian yoke: let his inspiration be what it would, he was compelled to work in making bricks, and in iron-furnaces. Such then was the deliverance of art and science from destruction, and the earth from returning to its primeval chaos.

All idolatrous substitutes for fine art, wood and stone deformities, God, by the mouth of Moses, repeatedly commands the children of Israel to destroy, in these and the like words. "And destroy all their pictures and destroy all their molten images."

After the establishment of Israel in Canaan, there are continual indications of fine art. So early as the song of Deborah, we hear of those who delineate with the pen or pencil of the writer. Gideon destroys the altar of Baal, but afterwards himself makes an idol. Micah's mother dedicates gold and silver to the Lord, to make a graven image and a molten image; but Micah makes them a house of gods, which he worships and causes others to worship, not using them as works of art, but as idols.

We next hear of the image of Dagon, when the ark of God is taken by the Philistines; and of the golden emerods and golden mice, which were put into a coffer by the side of the ark, for a trespass-offering.

The image which Michal placed in David's bed, to deceive Saul's messengers, some suppose to have been a statue of David; it is called a teraphim.

But the most magnificent production of Hebrew art was the temple of Solomon. It contained the same cherubim that Moses had seen on the Mount; and they adorned and covered the whole temple within and without. Two in particular were placed in the holy of holies, of colossal dimensions: they covered the place of the ark with their wings; the height of each was ten cubits, and the breadth each spread his wings was ten cubits. A figure five yards high is capable of the greatest efforts at perfection in art, and this no doubt they had, being done by divine command, for purposes whose importance reaches to the end of time.

The brazen sea of Solomon's temple, and its twelve oxen; the two pillars, Jachin and Boaz; the candlesticks of pure gold, twelve in number; the ten lavers, and their bases and wheels, and ornaments of lions and oxen, and cherubim, works inspired by God and wrought by his holy Spirit, with the other sublime ornaments of Solomon's temple, as also Solomon's throne and its twelve lions. The excellence of the work must be considered as equal to the purpose of containing the covenant between God and man, and other dispensations relating thereto.

Thus, the art of sculpture was not only allowed, but encouraged and employed in the service of religion, in the representation of divine attributes or the symbols of divine Providence; and the abuse only of this art was forbidden when perverted to idolatrous and impious purposes.

But Solomon became an idolater: and it is said, "then did Solomon build a high place for Chemosh, the abomination of Moab, in the hill that is before Jerusalem; and for Moloch, the abomination of the children of Ammon." From this time fine art and inspiration were successively removed.

It has been thought necessary to be particular in giving quotations from the bible concerning the sculpture of the Hebrews, as it is the earliest of which we have any authentic account.

There are found in Syria, in the present time, ruins of monuments called the sepulchres of the prophets. These remains have nothing like the Egyptian or the Persian style of construction,

SCULPTURE.

construction, but are of Roman or Grecian origin, and must have been erected in an age greatly posterior to the prophets. This seems to be allowed in the words of our Saviour to the Pharisees: "Your fathers killed the prophets and ye build their sepulchres." It should seem that the Pharisees added Roman ornaments to the simple forms of ancient Hebrew veneration, as is signified in these words. "Ye build the tombs of the prophets and garnish the sepulchres of the righteous."

There are engravings of these sepulchral monuments, published by Mr. Cafafs in Paris.

Of Babylonian and Persian Sculpture, also of Asiatic Sculpture in general.—It may be proper to take only some general notice of the most ancient sculpture of other nations of the East, of which our accounts are very imperfect, previous to the description of Egyptian sculpture, for two reasons; first, that the sculptures of these nations will have considerable light thrown upon them by the Egyptian remains; and, secondly, because, as the history and examples of Egyptian sculpture are abundant and successive; they lead us more naturally and accurately to the great object of our present enquiry, Grecian sculpture.

In the very ruined state of some, and the utter devastation of most of those countries in Asia which were once the seats of art and science, the traveller in vain seeks for memorials of Noah, or of Abraham, or of Moses, or even of Solomon: all historical record of these early times is without corroborative evidence from remaining monuments.

The first method of transmitting ideas to posterity is supposed to have been by hieroglyphics or ideal writings, whether painted or sculptured. Such also was used in Mexico when first discovered. All the most ancient writings approach to the figurative or ideal writing, every word being as much as possible a picture or image. Some of the learned have thought that the first chapters of Genesis were originally transmitted in this way.

How such figurative words could have occurred, previous to the art of ideal writing, cannot be easily conceived. The author of a figurative expression must have a figurative idea in his mind, and that is a hieroglyphic, which might as well be painted or sculptured as written, and with infinitely greater effect on the reader.

The descriptions of the creation and fall of man, of the flood of Noah, of the building of Babel, and of the departure of Abraham from Chaldea, are each of them a sublime series of ideal writing.

After the flood, when men began again to multiply upon the earth, Nimrod's followers are said to have "builded a city and a tower, whose top should reach unto heaven." The sacred writings do not mention any thing of sculpture in this building. But Berosus says, that representations of the terrific forms that inhabited chaos previous to the creation, were to be seen on the walls of the temple of Belus in Babylon; and that these consisted of human figures with wings, of human figures with two heads, of others with legs of goats and with horns; and that they were executed both in painting and sculpture.

There are no works of sculpture discovered in any country at all to be compared with Greek art. All the great empires, previous to the age of Pericles, are vanished; not any thing of Nebuchadnezzar, nor of Semiramis, nor of Belus; their names remain in history but not in sculpture, and it cannot be certified whether the golden image of Nebuchadnezzar was merely a colossus or a work of fine art.

Much less can we speak of Belus, from any thing that remains. Herodotus, in describing the temple of Jupiter Belus in Babylon, says it is a "square building, two stades

in length on every side, having gates of brass, as may be seen in our time. In the midst of this temple stands a solid tower of one stade in height, and in length and breadth the same measure. On this tower another is built, and a third upon that, till they make up the number of eight. The ascent to these is by a way carried round the outside of the building to the highest part. In the midst of the ascent is a place, where those who go up may rest themselves. Within the uppermost tower a spacious dome is built, in which a table of gold stands, at the side of a magnificent bed. No image is seen in this place, but in a chapel which stands below within the temple, a large image of gold, representing Jupiter sitting, is placed on a throne of gold, by a table of the same metal, all together weighing eight hundred talents, as the Chaldeans affirm. Without this chapel is an altar of gold, and another of a greater size, which is used when cattle of full age are sacrificed; for on the golden altar no other than sucking victims may be offered. On the great altar the Chaldeans consume yearly a thousand talents in incense, when they celebrate the festival of this god. Besides these things, a statue of solid gold, twelve cubits high, stood formerly in this temple, which, because I did not see, I shall only relate what I heard from the Chaldeans. Darius, the son of Hytaspes, had designed to take away this, but had not courage for this purpose; but Xerxes, the son of Darius, not only took away the statue, but killed the priest who had forbidden him to remove it. In this manner the temple of Jupiter Belus is built and adorned, not to mention divers other donations consecrated there by private persons."

Diodorus Siculus has given a description of the works of queen Semiramis in Babylon. "She built two palaces, at the end of the bridge upon the banks of the Euphrates. That on the west had a high and stately wall, built circular, upon which were portrayed in the bricks, before they were burnt, the forms of all sorts of living creatures, laid with great art in curious colours. This wall was in circuit forty furlongs, in height a hundred yards, upon which were turrets a hundred and forty yards high. The third and most inward wall immediately surrounded the palace, thirty furlongs in compass, and far surmounted the middle wall both in height and thickness; and on this wall and the towers were represented the shapes of all sorts of living creatures, artificially expressed in the most lively colours: especially was represented a general history of all sorts of wild beasts, each four cubits high and upwards. Among these was to be seen Semiramis on horseback, striking a leopard through with a dart; and next to her, her husband Ninus, in close fight with a lion, piercing him with a lance. This palace far excelled that on the other side of the river, both in greatness and adornments, for the outermost wall of that made of well burnt brick, was but thirty furlongs in circumference. Instead of the curious portraiture of beasts, there were the brazen statues of Ninus and Semiramis, the great officers, and of Jupiter, whom the Babylonians call Belus, and likewise of armies drawn up in battalia; and diverse sorts of hunting were there represented, to the great diversion and pleasure of the beholders. In the middle of the city she built a temple to Jupiter, whom the Babylonians call Belus. Upon the top she placed three statues of beaten gold, of Jupiter, Juno, and Rhea. That of Jupiter stood upright, in the posture as if he were walking. He was forty feet in height, and weighed a thousand Babylonish talents. The statue of Rhea was of the same weight, sitting on a golden throne, having two lions at her knees, standing one on either side, and near to them two exceeding great serpents of silver, weighing thirty talents a piece. Here likewise
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the image of Juno stood upright, and weighed eight hundred talents, grasping a serpent by the head in her right hand, and holding a sceptre, adorned with precious stones, in her left."

But Babylon is now a ruin, nor are the caverns of the earth found to yield any fragments of her ancient sculptures.

Among the ruins of the Persian monarchy, which display themselves in melancholy state amidst the deserts, is Persepolis. The fragments of sculpture that here remain are very rude, and give an idea of the mere infancy of art, though of gigantic dimensions. Such are those sepulchral monuments carved on high in the rock mentioned by Isaiah in these words. "He that heweth himself out a sepulchre on high, that graveth an habitation for himself in a rock."

The ruins of Persepolis present examples of Persian sculpture on the wall, and in the portals of its ruined palace, and also on the tombs of its kings. Their antiquity may be about the time when Ahasuerus removed the seat of government from Babylon to Shushan. We hear that Alexander took possession of Babylon, Shushan, and Persepolis, the chief cities of the Persian empire, and burnt down the palace of Persepolis, of which the ruins now remain. They are hardly more ancient than that removal of the Persian government by Ahasuerus, who is Darius Hystaspes.

This palace of Persepolis has its walls still remaining on three of its sides. The extent of the front comprehends six hundred paces, from north to south; it is three hundred and ninety from west to east. On the west front are two magnificent stair-cases, consisting each of two flights of steps. On the top of these stair-cases are seen two grand portals, one fronting the west, the other eastward; between them are two magnificent columns, each fourteen feet in circumference and fifty-four in height: within the portals are carved, in stone, the heads and breasts, and front feet projecting beyond the portals, of two animals somewhat like sphynxes, twenty-two feet from the fore to the hinder legs, and in height fourteen feet and a half; they have the body of a horse, with the legs thick and short, like those of a lion: there is some appearance of their having had human heads, one of them having a crowned bonnet like a turret. The other of these grand portals eastward has two somewhat similar animals, but these have wings on their shoulders, their dimensions being nearly the same with the former. And at the distance of a hundred and seventy feet from this portal are two stair-cases like the former. The walls which belong to these stair-cases are six feet seven inches high, of which the lower stones make it evident that they were adorned with figures in low relief. The upper part of the flight is embellished with foliage, and the representation of a lion rending a bull, much larger than life, and likewise in low relief. The stairs are seventeen feet in length, three inches high, and fourteen inches and a half in breadth.

What remain of this palace are chiefly pillars and porticoes, the pillars being fluted, having bases and capitals of uncouth ornament, of sometimes an animal's head and neck, and sometimes ornaments like Gothic arches. All the upper part of the building is entirely destroyed, and what remain of that below are only separate members, which have little connection with each other. Some of the columns are 70 feet high, and have been as numerous as 76 in a range, though but comparatively few remain, and those terribly mutilated.

The other ruined portals are ornamented with figures carved in the insides of the jambs, of rude grandeur: on one portal is a man fighting with a lion; on another, a man fighting with a griffon or horned lion; and on a third, a figure like a

king, with two figures behind him, one with a parasol, the other with a sea-horse's tail, which being set in a gold handle, is used in Persia at the present time to drive away flies. Over his head, in the air, is a little figure on eagle's wings, perhaps a god or a genius. Another portal has a great many figures in different compartments, one above the other: in the top compartment is a figure sitting on a throne; on another ruined pilaster, which was once the side of a doorway, is a figure sitting on a throne, and behind him an attendant; beneath, in three compartments, are many little figures much defaced. Other pilasters have had other ornaments, and unknown characters of letters shaped like the heads of arrows, disposed in different directions and in different combinations. The windows of these ruins, some of which remain, were ornamented also with sculptures in the same manner as the doors. One that remains has a man holding an animal by the horn, which is single and very long, and bending backwards; before them walks a figure of a man with something in his hand, like a sacrificing instrument: other windows have also the same unknown characters of letters engraved on their sides.

The stair-cases are half buried in the earth, and toward the top very much broken; they have each two flights of steps with landing places between, the walls of which, and of the stair-cases, have been ornamented with sculpture, in two ranges, one above the other. The first six figures at the entrance are smaller than the rest, and have large vestments with plaited sleeves, and a round bonnet rising in plaits, and larger in the upper than in the lower part; they have hair and long beards; each holds a lance, and a quiver of arrows is fastened at their back with a strap carried over the shoulder. The figure which is next in order, precedes a train of others; he holds the next by the left hand, and grasps a fork with the right. It seems to represent an ecclesiastic at the head of a procession of others; he is likewise arrayed in a large robe, with a girdle hanging down very low. The three figures by which these are succeeded have shorter robes and sleeves, with upper and under vests, and pointed bonnets formed into five plaits: these are properly the tiaras, called also reflexa, sloped into a curve backwards, contrary to the tiara Phrygia, which are bent forwards. Two of these figures hold a basin in each hand; a figure following them has two hoops or circles in his hands. This is followed by two horses drawing a chariot, and by two other figures that place their left hands, one on the back, the other on the neck of the horses. They are all represented with hair and beards; the two last bare-headed, the other has a bandage or diadem.

Between each compartment of six or seven figures, is a kind of vase, and the two first figures always hold each other by the hand. A horse, led by the bridle, follows the two first figures in the second compartment; three figures following this, one of which bears something that resembles a vestment. In the third compartment are five figures with little basins or buckets, and two others with balls or globes. Those in the fourth compartment are not habited so well as the others, having only a very straight vest, with a cinchure, and long drawers, which are straight and plaited: three of these figures have also basins or little buckets in their hands, and are followed by a camel, having two hunches on his back, with a little bell hung round his neck, after the manner of the eastern caravans, that the sound may be heard at a distance, especially when they pass through narrow defiles; to give notice also to the inhabitants of the caravan's arrival: it is a signal likewise to those who have lost their way, and enables them to join their companions. The last compartment is distinguished by a figure bearing a pole, with a pot suspended at each extremity; and in each of these pots are

SCULPTURE.

seen little water vessels in an upright position: the habit of this figure is but indifferent. A mule, or an ass, is represented next, with two men armed with poles, followed by another figure bearing two mallets. Several other characters appear next, and last of all a great lion encountering a bull, or some other animal, from whose forehead a single horn is extended.

There are forty-eight figures of men and beasts in this range, and as many in that above it, which consists of the following figures. The first six of these are meanly habited; each of them has some vestment in his hand. Those that follow carry the same, but are better arrayed. Most of them are greatly impaired by time. These are followed by an ox led with a halter. The only difference between this and the third compartment is, that in the latter, two rams are led, and each has a large crooked deflected horn. After these appears a figure armed with a buckler, and another leading a horse by the bridle, followed by a third with two hoops: the other three are habited like the preceding figures. Next comes a led ox, followed by a man armed with a lance and shield, behind whom appears two other figures, each with three lances, and their sleeves longer than their vests. The last figures that follow have very short vests, with drawers that are long and straight, which come down to their feet; they are armed with long bucklers hanging at the girdles of their waists; two of them have hoops in their hands, and a third a fork; they are followed by a horse led by the bridle.

Such are the figures on this stair-case. Toward the west side, and toward the east side, are as follow. Twenty-eight figures, each grasping a lance with both hands; their vests are long and wide, and they are represented with hair and beards, and seem to be bare-headed, unless we may suppose them to wear a plaited bandage, or kind of diadem. These are succeeded by a number of other figures, armed with long bucklers, which are pointed and bent at one end, with a short broad dagger hung at their girdles: their vests are of unequal lengths; they are like the last figures in the dress of their heads; they have also some ornament in one hand, and the other is placed upon their beard. This range consisted of sixty figures, the last of which are defaced. All these figures seem to represent some triumph, or procession of people bearing presents to the king, which was customary under the ancient monarchs of Persia, and is practised at this day.

A traveller counted 1300 figures of men and animals remaining in this great ruin.

There is another immense ruin in the deserts of the ancient empire, called Palmyra or Tadmor, said, in the Book of Kings, to be built by Solomon. The present ruins of this great city are very different from those of Persepolis, and indicate a much more modern construction; and that if Solomon originally built this city, the Roman emperors, and particularly Adrian, so far re-edified it as to leave no traces of greater antiquity.

As the remains of Palmyra, though vast and stately, are more properly architectural than sculptural, we shall refer the reader, to satisfy further curiosity concerning them, to the admirable work of Wood and Dawkins; for whatever remarks might be requisite on the sculptures of Palmyra, would more properly belong to observations on that subject in the section of Roman sculpture. See PALMYRA.

Balbec, near the site of the ancient Damascus, is another ruin of the same description. (See BALBEC.) As for those many great cities mentioned by the Hebrew prophets as flourishing in their time in magnificence and riches, the places of some of them cannot be found, such as Teman, the capital of Edom, and the cities of Moab and Ammon, of Ashur and Aram; some are dwindled into little villages, and most

have left no traces in the desert where they might be found. With regard to Heshbon and Rabbath, and Bozra and Hamath, all the mighty cities described by Isaiah and Ezekiel, as filled with multitudes in power, riches, and magnificence; the cormorant and the bittern possess them, the wolf howls there, and the wild beasts inhabit those forsaken places, where ancient kings and their counsellors, and warriors, thought they had built an everlasting habitation; even Nineveh and Damascus are now indeed no more; they are, as the prophets said, "gone down into the nether parts of the earth," nor does history deign to tell their tale.

And of the ancient Tyre, and its Hercules of ancient Tyrian art, there are no remains. Herodotus says, "I failed to Tyre, in Phœnicia, because I heard there was a temple dedicated to Hercules. That temple I saw, enriched with many magnificent donations, and, among others, with two pillars, one of fine gold, the other made of a smaragdus, which shines by night in a surprising manner."

The Tyrian Hercules, or god of Tyre, is thus described by the prophet Ezekiel. "Every precious stone was thy covering, the sardius, the topaz, and diamond, the beryl, onyx, and jasper, the sapphire, the emerald, the carbuncle, and gold. The workmanship of thy tabrets and pipes was prepared in thee in the day that thou wast created. Thou art the anointed cherub that coverest, and I have set thee so; thou wast upon the holy mountain of God, and thou hast walked up and down among the stones of fire."

It looks as if there was some omission in the account Herodotus gives of this temple of Hercules, in Tyre. Herodotus, indeed, saw this temple after the ruin of Tyre by Nebuchadnezzar, consequently not in its glory, as Ezekiel had seen it; he has described the pillars as stones of fire, but he has not said any thing of the god; perhaps, in his time, the statue of Hercules had been taken away by mercenary cupidity, as the statue of gold in Babylon had been removed by Xerxes. Such is the melancholy picture of ancient times, the fulfilment of the denunciations against these ancient empires; "they utter a faint murmur out of the dust."

As there is a general resemblance in the early attempts at fine art in different nations; so there may be a likeness traced between the productions of Hindoo sculpture and the early productions of art in Egypt, Greece, and Etruria; however, we must always remember that the accurate observations made by the Greeks on beautiful nature, assisted by the regular progress in science, soon gave their productions a decided superiority over those of every other people.

The caverns of Elephantis and Ellora are vast halls excavated in the rocks, equal in dimensions to the large temples of other nations.

That of Ellora is architecturally divided, by rows of columns, into aisles; the friezes, and pannels in the walls, are filled with sculpture, detached, or in series, of the mythological personages, and acts of the Brahmin religion.

The sculpture of Elephantis is of the same kind, with the addition, at one end of the temple, of a colossal bust of the triple-faced Bramah.

The columns of these temples offer a continual variety of ornaments in their capitals, shafts, and bases; redundant and extraordinary for the application of the lotus, canes, and other vegetable and animal productions of the country, in which the human figure is occasionally introduced.

On the banks of the Ganges are continually seen such ancient works of sculpture in the living rock, of inferior dimensions, but of the same sacred character, obelisks magnificently adorned, the figures of oxen, horses, tigers, elephants, &c.

The necessity of hastening to the great object of our present

SCULPTURE.

present enquiry, Grecian sculpture, makes it impossible to do more than refer to examples for Hindoo sculpture, as they are so elegantly displayed by Mr. Daniel among those stupendous buildings of the East, which, in his exact representations, have not only honoured our own country, but have gratified every lover of art throughout Europe.

Of Egyptian Art.—Egypt, the land of science, was visited by the most distinguished of the Greeks in arts and letters, among whom we find more especially the names of Orpheus, Dædalus, Linus, Homer, Thales, Pythagoras, Plato, and others of distinguished wisdom; all went to Egypt, as to the wisest nation of antiquity, for instruction. The earliest historian, Herodotus, went also, and has given an account of this extraordinary country. He says, that in the time of their king Amasis, Egypt contained 20,000 populous cities. The remains, at this present time, as described by the latest travellers, are more stupendous than those of any other country, as five vast palaces and thirty-four temples, with their attendant sculptures and paintings: though devastated by the tempest of war deluge after deluge, still the colossal power of Egypt has a remnant left to testify what it once was.

Herodotus says, on the authority of the Egyptian priests in his own time, from Egyptian records, that Menes was the first king of Egypt, after whom reigned three hundred and thirty kings; among these was a woman, named Nitocris. Of the actions of these kings, he was told, no record remained, except of Nitocris, and of Mæris, the last of these kings. He says, I shall, therefore, pass them by, to relate the memorable actions of a succeeding king, whose name was Sesostris. That he conquered all nations, and caused his image to be carved on stones in the countries that he subdued, which he describes thus. His figure is five palms in height, holding a bow in one hand, and an arrow in the other, and armed after the Egyptian and Ethiopian manner. On a line, drawn from one shoulder to the other, these words are engraved in the sacred letters of Egypt: "I obtained this region by the strength of these arms."

After Sesostris reigned six kings. Statues made in the time of the last of these were in ruins in the time of Herodotus, which was about the year of the world 3500. When Herodotus saw them, the hands had dropt off through age, and were lying on the floor of the temple. Afterwards reigned in succession four kings, who were succeeded by twelve kings, all reigning at one time over Egypt, who built the magnificent labyrinth which Herodotus describes. These were succeeded by four more kings in succession; but no work of importance is ascribed to any of them. They were succeeded by a king named Amasis.

The works of Amasis, as described by Herodotus, are exactly like those whose ruins remain to this day. Herodotus says, that Amasis was a great lover of the Grecians, and permitted them to establish themselves in Egypt, and erect temples and altars to the gods. He also took a Grecian wife, and sent consecrated donations to Greece, particularly a gilded statue of Minerva to the city of Cyrene, a colony of the Greeks, with his own resemblance taken from the life. To Lindus he gave two statues of stone, representing the same goddess, together with a linen pectoral of admirable workmanship. He sent two statues of himself, carved in wood, to the city of Samos; where, our author says, this day they are seen standing in the great temple of Juno, behind the gates.

His works in Egypt Herodotus thus describes. "He caused a colossus, lying with a face upwards, 74 feet in length, to be placed before the temple of Vulcan at Memphis; and on the same basis erected two statues, of 20 feet

each, wrought out of the same stone, and standing on each side of the great colossus. Like this, another is seen in Saïs, lying in the same posture, cut in stone, of equal dimensions. He likewise built the great temple of Isis, in the city of Memphis, which well deserves to be admired.

"He built the admirable portico, which stands before the temple of Minerva in Saïs; far surpassing all others in circumference and elevation, as well as in the dimensions of the stones; and adorned the building with colossal statues, and the monstrous figures of androphynxes. One part of the stones employed in this work were cut in the quarries of Memphis; but those of the greatest magnitude were conveyed by water from the city of Elephantis, distant from Saïs as far as a vessel can make in twenty days. But that which I beheld with the greatest admiration was a house he brought from Elephantis, made of one stone. Two thousand men, all pilots, were employed during three whole years in the transportation of this house, which is in front twenty-one cubits, in depth fourteen, and eight in height. This is the dimension of the outside."

Such works are ascribed to Amasis, who was conquered by Cambyfes, the son of Cyrus the Persian, about the year of the world 3400, a hundred years before Herodotus; so that 500 years will remain to be occupied in Egyptian history, from Sesostris to Amasis; and within this time, those Egyptian buildings and works of sculpture, which the priests represented to Herodotus as so very ancient, might easily have been produced.

Thus a division is made between the fabulous and the historic ages, both in Egypt and Greece; and a decided era produced, which will not infringe on the truth of sacred scripture, nor on the credibility of authentic Gentile history; and by a comparison of the remaining monuments, it may give some date to the early works of Egypt and Greece.

The moderns have been no less zealous to examine the remaining ruins of Egypt, than the ancients were to contemplate its ancient glories.

Of these wrecks, these ruins of ancient knowledge, the late publications of Egyptian antiquities give majestic and awful ideas. Some of the drawings made by the French Institute in Egypt have been published, and they display what Egypt once was.

The ruins of Egypt are contained in a compass of about 550 miles along the banks of the Nile, among pyramids, and pillars, and porticoes, and subterranean palaces hewn out for the dead.

The first objects of Egyptian sculpture that seize hold on the imagination are the colossal statues: among these are the sphynx, and the statues called Memnon or Olymandue. The sphynx is situated so near the pyramids of Giza, as to make it apparent that those masses of solid bulk were accompanied by other masses of ornamental sculpture; and being divested of their gigantic accompaniments of intellectual labour, the pyramids are left alone, inexplicable monuments of lost wisdom as well as departed power.

The sphynx is thus described by Ripaud: the length of the rock, to which the form of this chimerical animal has been given, is about 95 feet; its height from the knees to the top of the head is 38 feet. The ancients very generally believed that there was a passage in the body of the sphynx, which led by subterranean channels to the interior of the pyramid. It is still conjectured that, beneath these enormous masses, caverns have been dug, which some suppose to have been employed in the mysteries of initiation. On the head of the sphynx there is a hole five feet in depth; and it may even extend further. There are also appearances of another opening of the same kind on the back of the figure.

SCULPTURE.

The head of the sphynx bears the lineaments of a Negro. It is deprived of the nose.

Of this monument Denon says: although the proportions of the sphynx are colossal, the contours are free and pure; the expression of the head is sweet, graceful, and tranquil. It is the character of an African; the mouth and lips thick, with a softness in its movements, and a fineness in its execution, truly admirable: it is the flesh and the life. At whatever time this was produced, art was without doubt in a high degree of perfection. If there is wanting in this head that which we call style, that is to say, those forms, just and exalted, which the Greeks have given to their divinities; it is but justice to acknowledge, that there is no great and sweet character of nature which we cannot admire in this figure: if we are surprised at the dimensions of this monument, no less are we astonished at its execution.

The temples of Karnac and Luxor, on the right bank of the Nile, together with those of Medinet Abou and the Memnonium on the left bank, are supposed to occupy the situation of the ancient city of Thebes. The ruins of these temples are of vast extent. The palace of Karnac was in front 240 feet, and its depth near three-quarters of a mile. It consisted of four great courts of nearly equal dimensions, comprehended within a long square: the first court was occupied by four rows of columns; the second court had 130 columns, the largest 11 feet in diameter, the smallest 7 feet; the third court was adorned with obelisks 90 feet high, and colossal statues, surrounded by various royal apartments. On each side of the entrance to the fourth court was a saloon of granite: the rest of the space was occupied by porticoes, colonnades, and numerous chambers for officers and attendants. This palace, with four dependant structures of similar magnificence, but inferior proportions, was approached by four paved roads, bordered on each side with figures of animals, each 15 feet long. In one avenue were 90 lions; in another avenue, sphynxes; in another, rams; and in the fourth, lions with hawks' heads. From the ruined state of these avenues, we have no computation of the number of animals by which they were bordered; though it is almost certain that they were not fewer than 300, and it is possible they might be many more. In this palace 22 colossal statues still remain, and a great many statues of granite, and fragments of the size of nature; besides which, the walls were nearly covered within and without with basso relievos and pictures. The lesser structures in this group of buildings were adorned in the same manner, and communicated with the other palaces of Luxor and Medinet Abou, as well as the Memnonium, which was the magnificent tomb of Osymandue or Memnon.

The Memnonium looks to the east: it is a palace of the most ancient construction, and its dimensions also colossal. In one of its courts are seen the remains of the celebrated statue of red granite, which may be considered as that of Memnon. Its height was 64 feet, and its remains are scattered 40 feet around it. One of its feet subsists almost entire, whose breadth is $4\frac{1}{2}$ feet; and one of its ears measured 39 inches in length. The excavations are still visible, where the wedges were placed which divided the monument, when it was thrown down by Cambyfes.

Between the Memnonium and Medinet Abou, and distant about half a league from each of them, are the remains of a great number of colossal statues and traces of buildings, which indicate that these two places communicated with each other by structures which filled up the whole space between them. This mass of edifices appears to have composed, according to Diodorus Siculus, the tomb of Memnon or Osymandue. We are confirmed in this conjecture, by the

conformity which exists between the monuments in their present state, and the extensive as well as precise descriptions which that writer has left of pictures which are found in both palaces. They represent the sieges of fortified towns, hostile invasions, and victories obtained by the Egyptians.

The Memnonium has not been finished, as well as the greater part of Egyptian works, where, by the side of objects but roughly hewn, are seen examples of exquisite finishing. Between the Memnonium and the palace of Medinet Abou are the largest colossal statues which now remain in Egypt: these are the figures now called Memnon. They are both sitting, with their heads looking straight forwards; both their hands lying equally on their knees; their feet straight forward, and their legs in an upright position, and both alike. One of these, according to the descriptions in Diodorus and Strabo, and those who copy their writings, was the famous statue of Osymandue, the largest of all the colosses. The height of them is about 58 feet. Three smaller female figures accompany each of the colossal statues, which are standing one on each side of the chair, and one between the legs of the principal figure: these are in basso relievo; and that on the pedestal or chair of the southern figure wants no charm of delicacy in the execution. It is on the leg of that figure, towards the north, on which the inscriptions are written of those illustrious ancient travellers who visited the statue of Memnon: there are innumerable inscriptions of names of all dates, and in all languages.

But Denon gives it as his opinion, which is also that of Ripaud, that the two statues now standing are the mother and son of Osymandue; the figure of Osymandue itself now lying in ruins, as was before described.

The great temples of Hermopolis; the great city of Mercury; of Tentyris, or Dendera; of Latopolis; of Karnac; of Apollinopolis, or Edfu; of the islands of Philae, and of Elephantine; are all now in ruins, covered with remaining examples of Egyptian sculpture, both in statues and in hieroglyphical representation, on the walls, and on the pillars and porticoes, within and without; many of which are works of great labour and care, as well as intelligence in art.

M. Ripaud says, the execution of the figures engraved on the exterior and interior walls at Dendera, is an example of the highest point of perfection to which the Egyptians attained. All the minutiae of their dress are finished with a purity and delicacy most admirable, considering the impracticability of the stone. The elevation of this temple is 72 paces in breadth, and 145 in length; the portico is 60 paces in length, and 30 in breadth. Its most remarkable decoration is the great zodiac, divided into two bands; it enriches the ceiling of the two last intercolumniations to the right and left. The saloon succeeds to the portico, and is supported by six columns, whose capitals display four figures of Isis, with the ears of a cat. The compartments of the walls are decorated with pictures, in which is a great number of female figures.

On the terrace of the great temple is a small one, the columns of which are like those of the portico: this temple forms a square of nine feet, and is the portico of a chapel, of which there are no traces. In the inner part of the temple is an apartment, which is adorned with a zodiac; it is circular, and occupies one-half of the ceiling. The apartment appears to be consecrated to astronomy. It is separated from another astronomical sculpture by a female figure in bas relief, of a large size, occupying the whole diameter of the ceiling; it presents a contour easy, and of beautiful

SCULPTURE.

beautiful proportions; its feet, well preserved, are in a beautiful style; it does not present any attribute, except a collar, which is often seen on figures of Isis; the hair is curled, and falls on each side of the face; and on each side of this figure are hieroglyphical inscriptions.

At Luxor, which is part of ancient Thebes, are the remains of a palace, having in its front two obelisks of granite; their height is seventy feet above the earth. Near these are two colossal figures buried up to the breasts; and judging from the size of what is above the earth, we may reckon that thirty feet are buried, which gives a hundred feet to these obelisks. They are in perfect preservation: the hieroglyphics upon them are most laboriously finished: the labour to cut them from the quarry must have been immense, as well as to transport them to the place where they now stand. The parts preserved of the two colosses are admirable pieces of sculpture, and were finished in the most careful manner. Behind these are two great moles, which formed the gate; they are covered with sculptures representing chariots drawn by two horses, each having only one conductor.

It is remarkable, that neither the colossal figures, nor the monuments, are on a line with each other, nor with the gate; also, they are so close together, that the distance between the moles and the obelisks, comprehending the colossal statues between them, is but eleven paces; each of which objects in an insulated position, would astonish the beholder with its size.

The temple of Hermuntis was consecrated to Isis, whose delivery from Typhon is sculptured on the walls in basso relievo; it is a beautiful, elegant structure, but dreadfully ruined.

Efne, the ancient Latopolis, has a temple, the portico of which is in good preservation; it was dedicated to Jupiter Ammon, as appears from a medallion over the gate in the inner part of the ruin. The hieroglyphics and pictures represent a great number of sacrifices offered to this deity, and to rams, his emblems: the most curious of these represent the offerings made to crocodiles, and the worship of the Nile. The triumphs of the signs of Leo and Cancer are equally distinguished. Hieroglyphics are sculptured in relief on the columns, very beautiful for their workmanship. This temple is one of the most remarkable in Upper Egypt, as well for the perfect preservation of the portico, and its parts that still remain, and their fine execution, as for the very interesting pictures, which relate to those minutiae of Egyptian worship which are least known: here is also found one of the remaining zodiacs. This is one of the most beautiful monuments of antiquity; most perfect in proportion, and beautiful in execution, of all the temples in Egypt.

Edfu, or Apollinopolis, is the most spacious as well as the best preserved of all the Egyptian temples, and where the Egyptian architecture displays itself with supreme magnificence. It was dedicated to Horus, the Apollo of the Greeks. Here it is that the huge materials have been employed with the greatest care, though many of the stones have not been placed perpendicularly on their capitals, and several of the columns vary in their diameters. The drawing of the figures is correct, and there is some appearance even of perspective in the statues of Isis, that decorate the frieze of the portico.

The sculpture is particularly beautiful in the capitals of the columns that decorate this temple, every one different, but every one beautiful; they are totally original in the composition of their ornaments, and perhaps equally excellent with the admired Corinthian, or Ionic.

The temples at Elephantine and Philae are by no means inferior to any in Egypt; they are likewise adorned with

sculptures and paintings of the most perfect Egyptian workmanship.

But the abodes of the dead were particularly distinguished by the care of the ancient Egyptians. All the Lybian mountain, which is half a league to the west of the Memnonium, and ends opposite to Medinet Abou, is pierced from its base to three-fourths of its elevation, with a great number of sepulchral grottoes. Those which are nearest the surface of the ground are most spacious, as well as the most decorated; those which are in the most elevated part of the mountain, are much more rudely contrived and executed; while such as hold the middle place bear an adjusted proportion of space and ornament. Those which belong to the poor are the most interesting, because they always contain some representation of the arts which flourished, and the trades which were practised at that epocha. The plan of these grottoes is in a great measure the same. A door opening towards the east displays a gallery of about twenty feet in length, sometimes formed in a straight line; at other times it runs off from the entrance in an angle: it is indifferently supported by columns or pilasters. At the extremity of the gallery is a well that leads to the catacombs, where the mummies are deposited. The depth of these wells varies from forty to sixty feet; and they are connected by long subterraneous passages rudely shaped in the rock, which terminate in a chamber of about thirty feet square, whose sides are supported by pilasters, and contain large remains of the mummies. There are evident traces of numerous other subterraneous communications, which probably lead to other chambers that are at present concealed.

In the upper gallery are sculptured in basso relievo, or painted in fresco, a great number of subjects relating to funeral ceremonies. The most interesting pictures which are seen there, present a detail of circumstances connected with the ancient inhabitants of the country. There are represented their first occupations, such as the chase and the fishery. Thence we may trace the progress of civilization in the employments of the fadler, the cartwright, the potter, the money-lender, the husbandman, and in the duties and the punishments of the military life. Each grotto is adorned with a ceiling painted with subjects of fancy.

The tombs of the kings are about six thousand four hundred paces from the river. They have been formed in a narrow valley in the centre of the Lybian mountain. The ancient way thither is not known, and the spot is now gained by an artificial passage. These sepulchres occupy a large ravine, which is flanked by the bed of a torrent. The plan of one of these tombs will be sufficient to explain the general disposition of the rest.

Every grot communicates with the valley by a large gate, which opens to a gallery hollowed in the rock; its breadth and height are generally about twelve feet, and its length is twenty paces to a second gate, which opens to another gallery of the same breadth, and twenty-four feet in length. To the right and left of this gallery are chambers of five feet in breadth, and ten feet long. There are found paintings of arms of coats of mail, tygers' skins, bows, arrows, swords, lances, and quivers. In other sepulchral chambers are found household utensils, couches, chairs, stools, cabinets of exquisite forms; and if the artist has copied what existed, it is certain that the ancient Egyptians employed the wood of India carved and gilded; there are also other utensils equally elegant, as cups and vessels in all variety. Other funeral chambers are consecrated to agriculture; others to the utensils of the ploughman; others to instruments of music elegantly executed. The detail of preparing food is also there represented.

SCULPTURE.

It is in one of these chambers where are seen the two harps which were copied by Bruce. A third gallery succeeds, of the same dimensions as the former, and leads to a chamber above the level of the other apartments, which is eighteen feet square; from this chamber is the entrance to a gallery of thirty-four paces in length. There is also an inclining gallery, whose length is twenty-eight paces. At its extremity is a corridor of sixteen paces, leading to a chamber of eleven paces, which is connected with another of the same size, by a gallery of six paces: a square saloon then succeeds, supported by eight pillars; its length is twenty paces, and its breadth twenty: here is the sarcophagus which contained the mummy of the king. The Romans made some attempts to carry away this sarcophagus from the grotto where it is deposited; they had even tried to level the ground in order to facilitate its removal, but they very soon renounced the impracticable enterprize.

To the saloon of the sarcophagus another apartment succeeds, of twenty-five paces in breadth, and forty in length; the height of the tomb is seven feet, its length eight, and its breadth six; the total length of the gallery is two hundred and twenty-five paces. The tombs of the kings, throughout their whole extent, are covered with pictures and hieroglyphics, but the greater part are painted in fresco, and represent the most phantastic subjects. The researches into Herculaneum have discovered a great number of paintings executed in a similar taste.

One of the most interesting of these grottoes contains a sarcophagus that is still entire, and in its place; its length is sixteen feet, and height twelve, and its breadth six; it still preserves the lid adorned with the figure of the king, which is a single block of granite. How this was transported across the mountain, and afterwards introduced through a subterraneous passage two hundred paces in length, we can have no conception.

From the time of Strabo there were reckoned seventeen tombs of kings; and we shall still find the same number, if we may comprehend in this enumeration a superb grotto, whose plan is equally large and beautiful with that of the sepulchres of the Theban sovereigns.

This grotto is half a league to the north of the Memnonium, and is scooped out at the bottom of a mountain, whose enclosure contains many other tombs: the entrance of several of them is closed, but the greater part of them have been violated. It appears that those of the ancient Egyptians, who had remained faithful to their worship, endeavoured to conceal the knowledge of the sepulchres of their kings from their conquerors, or from the professors of other religions.

Two of these grottoes remain unfinished, and a third is altogether without sculpture; and some others offer to view several decorative objects in a very unfinished state.

The quarries of Silsilis, in Upper Egypt, present a species of façade cut into door-ways of immense size, and porticoes, in which are other door-ways leading into tombs, in the chambers and passages of which are figures as large as life, cut in the native rock, often only rough hewn, and the walls are both sculptured and painted. On the borders of the Nile we find these porticoes, entablatures, and corniches covered with hieroglyphics cut in the rock. Beneath these are a great number of tombs, all cut in the rock. They are formed into galleries, at the end of which are funeral chambers of seven feet by ten and eight feet by twelve: these chambers, and the passages leading to them, are ornamented with hieroglyphics traced upon the rock, and finished with coloured stucco, representing offerings; the ceilings are also stuccoed with ornaments and scrolls; often they are arched with an elegant elliptical arch, and painted and

sculptured in an exquisite style, displaying an agreeable assortment of colours, and an effect rich and graceful.

Most of the tombs are entered by a single door and gallery, and have only a single chamber, in which are one, two, three, or four figures as large as life, cut out of the rock, perhaps two brothers and their wives: the men sit in the middle and the women on the outside, with their hands passed under the arms of their husbands, who sit each with their arms across upon their bosoms. Some tombs have but one figure, perhaps of one who led a single life; another has three figures, a man and two women; the man in the centre and the women on each side, with their hands passed under the arms of the man, who has his arms crossed upon his bosom. The figures of men have little square beards, with head-dresses hanging down behind the shoulders; those of women have the same head-dresses, but hanging before their naked breasts. In some chambers the floor is cut into many tombs, of dimension and form to receive the mummies, and in the same number as the sculptured figures. Sometimes the principal figure holds the flower of the lotus, an emblem of death. And on the side of the door-way, at the entrance, we often see the figure of a woman in some attitude of lamentation. Sometimes there are two galleries or entrance into a single tomb; and one tomb in these quarries of Silsilis, the largest and best preserved of any, is 55 feet long in front and 15 high, with an entablature having five doors: the middle door is ornamented with an architrave covered with hieroglyphics: within the door is a gallery or passage 50 feet long and 10 wide, in the midst of which is another door-way leading to a chamber, at the further end of which are seven figures standing; and on the inside of the interior door are two niches, in each of which is a figure also standing: other figures are also in the passage or gallery, all cut in the rock. In the façade without are seven niches, three large with figures, the others smaller; those with the figures are all cut in the rock, the rest of the rock remaining in its primitive form.

Such are the ruins of a nation so celebrated, that it was the place where the wise men of that truly wise people, the Grecians, resorted as to the school of science.

The universal and profuse employment of sculpture by the Egyptians, both in colossal and minute dimension, for public and domestic purposes, for the service of the living and the dead, all induce us to enquire into the principles and quality of their productions.

We have not only the written evidence of ancient authors, but the demonstrative evidence of remaining works, that almost the whole of Egyptian sculpture was sacred, that is, representing divine qualities, attributes, and personifications, if we except the historical series on their tombs and palaces.

The Egyptian statues stand equally poised upon the two legs, having one foot advanced, and the arms either hanging straight down each side; or if one arm is raised, it is at a right angle across the body. Some statues sit on seats, some on the ground, and some are kneeling; but the positions of their hands seldom vary from the above description. Their attitudes are of course simply rectilinear, and without lateral movement; their faces are flattish; the eyebrows, eyelids, and mouths formed of simple curves, slightly but sharply marked, and with little expression. The general proportions are something more than seven heads high; the form of the body and limbs rather round and effeminate, with only the most evident projections and hollows: their tunics or other draperies are without folds in many instances. Winckelman has remarked, that the Egyptians executed quadrupeds better than human figures, for which

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SCULPTURE.

he gives the two following reasons: first, that as professions in that country were hereditary, genius must be wanting to represent the human figure in perfection; and, secondly, that superstitious reverence for the works of their ancestors prevented improvement. This is an amusing but needless hypothesis, for there are statues in the Capitoline museum with as great a breadth and choice of grand parts proper to the human form, as ever they represented in their lions or other inferior animals. In addition to the other observations on Egyptian statues, we may remark, that the form of their hands and feet are gross; they have no anatomical detail of parts, and are totally wanting in the grace of motion. This last defect, in all probability, was not the consequence of a superstitious determination to persist in the practice of their ancestors: it is better accounted for in another way: Pythagoras, after he had studied several years in Egypt, sacrificed 100 oxen for joy of having discovered that a square of the longest side of a right-angled triangle is equal to the two squares of the lesser sides of the same triangle; and thence it follows, the knowledge of the Egyptians could not have been very great in geometry at that time, which will naturally and sufficiently account for that want of motion in their statues and relievos, which can only be obtained from observation of nature assisted by geometry.

The state of Egyptian science in the time of Pythagoras being noticed, leads us to another consideration respecting the date of their architecture and sculpture. Most of their great works are mentioned by the ancients as done in the reign of Sesostris, and afterwards. Sesostris lived in the time of Rehoboam, king of Israel, about the time of the Trojan war, or 1000 years before the Christian era, which shews the arts of Egypt and Greece were in a progressive state at the same time. And from the Greeks residing with them to study theology, philosophy, and science; from the great intercourse, political and commercial, between the two countries from the heroic times; from the Greeks being long settled in the city of Naucratis, and other parts of Egypt, we may fairly conclude their communication in arts was just as free as in other concerns, which seems the more likely, as there is a considerable resemblance in the features and contour of the early Greek and Egyptian statues.

The Egyptian basso relievos are (generally but not always) sunk into the back-ground, being left level with the highest part of the relief; for which practice two reasons may be assigned; first, that as many of these basso relievos were cut in exceeding hard stones, basaltes and granite; as much time must have been consumed to clear away the ground about the figure, as had been employed to cut the figure itself; but besides the economy of time, when some hundreds or thousands of figures were engraven on the sides of a lofty obelisk, or the walls of a temple; the far greater number of them were at a great distance from the eye 50, 60 feet or more; in this case the ground, being left perpendicular to the figure the whole circuit of its outline, gave it a greater breadth of shadow and distinctness to the spectator. These basso relievos, which we comprehend in the general term hieroglyphics, or sacred gravings, represent different subjects, according to the place and purpose for which they were employed. On the walls of tombs they represent the professions, actions, and funerals of the deceased: in palaces, wars, negociations, triumphs, processions, trophies, with civil, military, and domestic employment of kings. In temples, they were the symbolical registers of theology and sacred science. On obelisks, they express hymns to the gods, or the praises of their kings. Ammianus Marcellinus has preserved part of a translation by Hermapion, the

Egyptian, of the hieroglyphics on the obelisk which formerly stood in the centre of the Circus Maximus; and at present before the church of St. John de Lateran in Rome. It imports, that the sun, the lord of the universe, gives to Ramefis the kingdom of Egypt, and dominion of all the earth in the city of Heliopolis. This translation seems sufficiently justified in the upper lines of the hieroglyphics, where a divinity is sitting, in the act of bestowing on a man, who kneels before him, stretching his hands to receive. In the following line the same man is seen again taking possession of an altar, on the side of which is the ox Apis, and on the top the mitred hawk, symbol of Osiris. Thus of the sacred emblems of Egypt.

The enormous works of Egypt have struck every foreign visitor with wonder and awe, from Herodotus to the members of the French Institute. Herodotus says, one of their buildings is equal to many of the most considerable Greek buildings taken together, and M. Ripaud observes, those works are so prodigious, they make every thing we do look little; and indeed, if we consider the execution of a statue 65 feet high, in so hard a material as granite, the boldest heart would be appalled at the incalculable labour and difficulties of the work.

In the Egyptian sculpture we shall find some excellent first principles of the art. Their best statues are divided into seven heads and one-third, or seven heads and one-half: the whole height of the figure is divided into two equal parts at the os pubis; the rest of the proportions are natural, and not disagreeable. The principal forms of the body and limbs, as the breasts, belly, shoulders, biceps of the arm, knees, shin-bones, and feet, are expressed with a fleshy roundness, although without anatomical knowledge of detail; and in the female figures these parts often possess considerable elegance and beauty. The forms of the female face have much the same outline and progression towards beauty in the features as we see in some of the early Greek statues, and, like them, without variety of character; for little difference can be traced in the faces of Isis, in her different representations of Diana, Venus, or Terra, or indeed in the face of Osiris, although sometimes understood to be Jupiter himself, excepting that in some instances he has a very small beard, in shape resembling a peg. The hands and feet, like the rest of the figure, have general forms only, without particular detail; the fingers and toes are flat, of equal thickness, little separated, and without distinction of the knuckles: yet altogether their simplicity of idea, breadth of parts, and occasional beauty of form, strike the skilful beholder, and have been highly praised by the best judges, ancient and modern.

In their basso relievos and paintings, which require variety of action and situation, are demonstrated their want of anatomical, mechanical, and geometrical science, relating to the arts of painting and sculpture. The king, or hero, is three times larger than the other figures. Whatever is the action,—a siege, a battle, taking a town by storm, there is not the smallest idea of perspective in the place, or magnitude of figures or buildings. Figures in violent action are equally destitute of joints, and other anatomical form, as they are of the balance and spring of motion, the force of a blow, or the just variety of line in the turning figure. In a word, their historical art was informing the beholder, in the best manner they could, according to the rude characters they were able to make. From such a description, it is easy to understand how much their attempts at historical representation were inferior to their single statues.

What has been hitherto said of Egyptian sculpture describes the ancient native sculpture of that people. After
the

SCULPTURE.

the Ptolemies, successors of Alexander the Great, were kings of Egypt, their sculpture was enlivened by Grecian animation, and refined by the standard of Grecian beauty. In proportions, attitude, character, and dress, Osiris, Isis, and Orus, their three great divinities, put on the Macedonian costume; and new divinities appeared among them, in Grecian forms, whose characteristics were compounded from materials of Egyptian, Eastern, and Grecian theology and philosophy.

In the reign of the Roman emperor Adrian, a number of statues, in imitation of the ancient Egyptian, were made to decorate the Canopus in his magnificent villa of Tivoli; several of which have been dug up, and placed in the Capitoline Museum. But Winckelman has remarked of these, that they may be known from the ancient Egyptian sculpture, having no hieroglyphics on them. But, besides this distinction, they are entirely unlike the genuine Egyptian; as the drawing and character are Roman, in Egyptian attitudes and dresses.

The ancient authors, who give the most satisfactory account of Egyptian antiquities, are Herodotus, Diodorus Siculus, Josephus, Strabo, Clemens of Alexandria, Jamblichus, and Orus Apollo.

The best modern books on this subject are Pococke's *Voyages*, Savary's *Travels in Egypt*, Norden's *Egypt*, Denon's *Egypt*; to which may be added, the most magnificent work of Ancient and Modern Egypt, now publishing in Paris, which will occupy twelve folio volumes, containing 840 plates, from the observations, researches, accounts, and drawings, of the learned men and artists of the French nation, who formed the French Institute.

Of Grecian Sculpture.—After Egyptian sculpture, the course of our subject naturally leads us to consider the same art in Greece, which is thought by some to have received its first principle from Egypt, and certainly preserved the character of Egyptian sculpture in many of its works, down to a late date; as Pliny observes upon the works of Egina.

In early times, the greater divinities were worshipped under the form of rude stones; and afterwards the lifeless representation of the human figure was attempted, with the eyes a little opened, the arms close to the sides, and the legs united in one common pillar for the support of the mass.

But about 1300 years before the Christian era, a sculptor appeared, whose works exacted the praise of poets, the speculations of philosophers, the record of historians, and continued to be preserved with zeal, and spoken of with respect, centuries after sculpture had risen to its zenith. This was Dædalus, the countryman and contemporary of Theseus, not inferior perhaps in fame and variety of adventures to that hero. Born of a royal race, the occasional friend and adversary of kings, admired for his works when living, and honoured with a chapel by the Egyptians after death! to him are attributed various mechanical inventions, fabulous and real: a fine portico to the temple of Vulcan at Memphis; the Cretan labyrinth, which was the copy of a hundredth part of the Egyptian labyrinth. Diodorus Siculus speaks of his works in Sicily. Pausanias mentions those remaining in Greece in his time, nine in number, of which three may be particularly noticed: one a naked Hercules of wood. The works of Dædalus are indeed rude, says Pausanias, and uncomely in aspect; but yet they have something as of divinity in their appearance.

Pausanias, besides the high character given of this statue, mentions it twice in his *Grecian Tour*; from which we must understand that it was held in considerable esteem and veneration. This would naturally lead us to hope we are not

without some copy of it in gems, coins, or small bronzes, by which all the most famous works of antiquity were multiplied. In the British Museum, as well as in the other collections of Europe, are several small bronzes of a naked Hercules advancing, whose right arm, holding a club, is raised to strike; whilst his left arm is extended, bearing the lion's skin as a shield. From the style of extreme antiquity which characterizes these statues, the rude attempt at bold action, the peculiarity of Dædalus, the general adoption of this action in the early ages, the traits of savage nature in the face and figure expressed with little knowledge but strong feeling, by the narrow loins, turgid muscles of the breast, thighs, and calves of the legs, we shall find reason to believe they are copied from the above-mentioned statue.

The same author says, the Gnostians had a chorus in white stone, made by Dædalus for Ariadne, which is mentioned in the 18th book of the *Iliad*, as youths and damsels dancing hand in hand. The most early Greek basso-relievos and paintings represent choruses of the Graces and Hours in this manner.

Endæus, the disciple of Dædalus, made a statue of Minerva, which Pausanias saw in the Acropolis of Athens. The learned author of the *Introduction* to the volume of *Sculpture*, published by the Dilettanti Society, supposes the heads of Minerva, on the early coins of Athens, were copied from this statue, which seems very reasonable, when we compare the style and costume with other works of the highest antiquity. And here we must observe, that in the early times of which we are now speaking, the rude efforts were intended to represent divinities and heroes only. Jupiter, Neptune, and several heroic characters, have the self-same face, figure, and action, as the Hercules of Dædalus described above; the same narrow eyes, thin lips, with the corners of the mouth turned upwards, and pointed chin; the same narrow loins; turgid muscular forms of breast, thighs, and legs; the same advancing position of the lower limbs; the right hand raised beside the head, and the left hand extended: and their only distinctions were, that Jupiter held the thunderbolt, Neptune the trident, and Hercules his palm branch or bow; as may be seen in ancient small bronzes and coins of Athens and Pæstum, and on the most ancient painted vases. The female divinities were clothed in draperies, divided in few and perpendicular folds; their attitudes advancing like those of the male figures. The hair of both male and female statues or paintings of this period is dressed with great pains, collected in a club behind, and sometimes entirely curled, in the same manner as practised by the native Americans, and the inhabitants of the South sea islands. Dædalus and Endæus first formed their statues of wood. Metal was also used for various purposes of sculpture in the most ancient times, as we learn from Homer, Hesiod, and Plutarch.

Dipænus and Scyllis, the Cretans, were celebrated for their statues in marble, about 776 years before Christ; still retaining much of the ancient manner in the advancing position of the legs, the drawing of the figure, and the perpendicular folds of drapery, disposed in zigzag edges. Soon after elaborate finishing was carried to excess, undulating locks and spiral knobs of hair, like cockle-shells, as well as the drapery, were wrought with the most elaborate care and rigid exactness, whilst the tasteless and barbarous character of the face and limbs remained much the same as in former times. This passion for high finishing in sculpture, will reconcile to our reason a passage in Pliny (b. xxxv. c. 8.), which has frequently been thought to disagree with the general history of ancient painting: he says, "that the picture of the battle of Magnete, painted by Bularchus, was paid for, with

SCULPTURE.

with its weight in gold, by Candaules, king of Lydia, who was coeval with Romulus, and lived in the 20th Olympiad, or about 750 years before Christ: thus," continues Pliny, "proving the fame and perfection of the art." Now, according to the same author's account, the ancient painting did not arrive at its greatest perfection until after the time of Phidias, or two hundred and fifty years later; and therefore it is likely that Bularchus's picture was chiefly valued for the same high finishing we see in the earliest marble statues, of which the following are examples:—colossal busts of Hercules and Apollo, in the British Museum, most likely those done by Dipœnus and Scyllis for the Sicyonians:—very ancient statues of Minerva, and a priest of Bacchus, lately in the Villa Albani, published by Winckelman in his *Monumenta Inedita*, and *Storia dell Arte*. To these might be added examples of extreme finishing in early Greek pateras and other bronzes. This observation on Bularchus's picture, and the sculpture of the same time, will naturally lead to another of more general comprehension, that the improvements in sculpture we have reason to believe followed those in painting according to the dates, as far as we are able to ascertain them in remaining works. Soon after this time may be reckoned the Amycleean Apollo, described by Pausanias as very ancient. The throne, with the image sitting upon it, Pausanias conjectured at not less than thirty cubits; he enumerates the subjects sculptured upon it; they comprehend the history of the fabulous ages underneath. The base is the sepulchre of Hyacinthus, which is entered by a brazen door. In the sepulchre are many works of sculpture. The figure of Apollo, Pausanias describes as of very rude art. Pausanias also mentions a brazen Hercules of ten cubits, as the work of a disciple of Dædalus.

Philocles the Egyptian, or Cleanthes the Corinthian, is said first to have introduced outlines among the Greeks, in the practice of which they were followed by Ardices the Corinthian, and Telephanes the Sicyonian, who used other lines within the outline, to express the marking of the body and limbs, also writing the names of those they painted, which agree with the earliest paintings on Greek vases, as their attitudes and peculiarities agree with early sculpture. Cimon Cleonius invented catagraphy, or the oblique representation of images, to give different views of the face, looking up, looking down, and looking backwards: he represented the veins, and the folds and plaits or wrinkles in garments. This Cimon is mentioned as living before the time of Phidias, which affords an additional argument for believing improvements in painting to have preceded those in sculpture; because oblique views of objects, and the veins of the limbs and body, seem not to have been attempted in sculpture before the time of Phidias.

Fortunately for us, the compendious history of painting and sculpture, left by Pliny, was selected from the writings of the best Grecian artists, and arranged, with attention to the several improvements, in chronological order, with such perspicuity and comprehension, that whenever, from the brevity of the work, we do not find all we wish for, yet by attending to the information before and after, we shall be easily enabled to supply the defects from other writings or monuments of antiquity. In this manner we shall satisfy ourselves concerning the progress of sculpture, in the two hundred and fifty years which elapsed between the age of Dipœnus and Scyllis and that of Phidias. The better drawing of the figure, with a more careful attention to its parts, more precision and variety of attitude, a less elaborate curling of the hair, the forms of the figure better shewn through the draperies, are all certain signs of a nearer approach to the age of Phidias. If we add to these observations the

different ages of writing on works of sculpture, what letters are wanting, and whether the inscription is in the Bouf-trophedon or ploughing manner, we shall not err much from the date of the work.

From the few historical observations now offered, it is evident that sculpture was eight hundred years from the age of Dædalus, to the time immediately preceding Phidias, in attaining a tolerable representation of the human form, which proves the slow growth of art perfected by manual labour in the infant state of science; whilst the means of subsistence are precarious, the rights of individuals undefined, and the general attention of society employed on self-preservation and defence, rather than on the increase of comfort or civilization of manners. Poetry and oratory, the more independent efforts of mind, appear in the earliest states of society, distinguish man as an intellectual and rational creature, scatter the first seeds of knowledge, lay down theories for the government of future generations, expand the mind, and direct the powers towards whatever is most useful and most desirable in the more perfect states of humanity.

The chief occurrences in the early history of Greece are, the Argonautic expedition; the war of Thebes; and the taking of Troy; in which particular heroism, or the united achievements of petty states, are interwoven with poetic fiction. Their consequences produced no considerable change in the manners of the people or the character of the country; but the battles of Marathon and Salamis, which destroyed the Persian army, whose myriads, like locusts, swarmed over the country, struck the first deadly blow to the Persian power, and gave a beginning to the Grecian or third great monarchy of the world. An event of so much importance, by changing fortune and transferring power in so large a portion of the civilized part of mankind, raised the character of Greece, in proportion to the abasement of Persia. The Greeks, particularly the Athenians, the champions of the war, whose heroic ardour was increased by success, sought additional distinction by every great and praise-worthy exertion of body and mind in arts and arms. The accumulated wisdom of ages, and discoveries in science, were taught by their philosophers; their temples and public buildings were raised with a magnificence unknown before, and decorated with all the powers of art. Æschylus, Euripides, and Sophocles, ennobled the minds of the people by their dramatic poetry. The five exercises which formed the body to exertion and beauty, and the mind to fortitude and patriotism, were universally practised, cultivated, and honoured. In this general spirit of enterprise and improvement, sculpture appeared in the school of Phidias, with a beauty and perfection which eclipsed all former efforts.

About 490 years before the Christian era, Phidias flourished at the same time with the philosophers Socrates, Plato, and Anaxagoras; the statesmen and commanders Pericles, Miltiades, Themistocles, Cimon, and Xenophon, with the tragic poets above-mentioned. This period was as favourable in its moral and political circumstances, as in the emulation of rare talents, to produce the display and encourage the growth of genius.

The city and citadel of Athens had been burnt by the army of Xerxes; but the Greeks, being conquerors, raised more stately buildings in the room of those destroyed. Phidias was engaged by Pericles in the superintendence and decorations of the temple of Minerva, and other public works.

Superior genius, in addition to his knowledge of painting, which he practised before sculpture, gave a grandeur

SCULPTURE.

to his compositions, a grace to his groups, a softness to flesh, and a flow to draperies, unknown to his predecessors, the characters of whose figures were stiff rather than dignified; their forms either meagre or turgid; the folds of drapery parallel, poor, and representing geometrical lines, rather than the simple but ever varying appearances of nature.

The discourses of contemporary philosophers on mental and personal perfection, assisted him in selecting and combining ideas, which stamped his works with the sublime and beautiful of Homer's verse.

How this sculptor was esteemed by the ancients will be understood by the following short quotations. Pliny says, "Phidias was most famous through all nations." And when enumerating the most celebrated sculptors of antiquity, he says, "but before all, Phidias the Athenian;" and Quintilian says, that "his Athenian Minerva and Olympian Jupiter, at Elis, possessed beauty which seemed to have added something to religion, the majesty of the work was so worthy of the divinity."

After such positive and magnificent testimony, there will be still room for our surprise, in the descriptions, fragments, and other authentic memorials, of some works only which he conducted and performed; such as the temple of Minerva, and the Acropolis of Athens, erected by Ictinus and Callicrates, under the direction of Phidias; and to him it is we likewise owe the compositions, style, and character of the sculpture, in addition to much assistance in the drawing, modelling, and choice of naked figures and draperies, as well as occasional execution of parts in the marble.

Pliny says, the emulators of Phidias were Alcamenes, Critias, Nestocles, Hegias; and twenty years afterwards, Agelades, Callon, Polycletus, Phradmon, Gorgias, Lacon, Myron, Pythagoras, Scopas, Parelus. In this list we certainly have the names of the sculptors employed on the temples of Minerva and Theseus; and as the styles of different hands are sufficiently evident in the alto and basso relievos, so there might perhaps be no great difficulty in tracing some of the artists by resemblance to others of their known works..

The two pediments of the temple of Minerva were each eighty-eight feet long, filled with compositions of entire groups, and statues from eight to nine feet high. The story of the western pediment related to the birth of Minerva, or rather perhaps represented her introduction among the gods. The eastern pediment was occupied by the contention of Neptune and Minerva for the patronage of Athens. Forty-three metops were charged with combats of the Lapithæ and Centaurs, and a frieze of three hundred and eighty feet round the wall of the temple, under the portico, was decorated with the procession of the Grecian states, in honour of Minerva, in chariots, on horseback, leading animals for sacrifice, bearing offerings, and presenting the sacred veil, in presence of the gods, sitting on thrones to witness the solemn ceremony.

The marquis Nanteuil had a drawing made of the western pediment of this temple, when the statues were all, excepting one, in their places; and notwithstanding some mutilations of parts, the whole was sufficiently entire for the composition to be perfectly understood from the marquis Nanteuil's sketch, carefully compared with the original fragments in the earl of Elgin's museum. In the centre, Jupiter sits holding his sceptre in his right hand, the thunder in his left; on the right of Jupiter, in an advancing position, Minerva takes possession of her car, while the reins are governed by Themis and Mars; from behind Themis, a genius leads Victory forward to attend the patroness of Athens; on the left of

Jupiter, Vulcan stands by his mother Juno; Amphitrite sits next, whose foot rests on a dolphin; Latona succeeds, with her infants Apollo and Diana, beautifully implying that the maturity of divine wisdom was older than the sun and moon. The last group is Venus sitting on the lap of Ocean; the figures at each end of the pediment are not shewn, because they are mere contingents, spectators only; not partaking in the action.

The idea of this composition seems to have been suggested by Homer's hymn to Minerva, a short poem, but one of the author's highest flights; in which he describes Pallas in full stature, and completely armed, issuing from the head of Jove; Olympus, the whole earth, and surrounding sea, trembling at the vibration of her spear; the sun staying his coursers in their race, and partaking in the same amazement with the other immortals.

The statue of Minerva, in the Parthenon at Athens, one of the master-pieces of Phidias, is thus described by Pliny, Pausanias, and other ancient authors. It is in height twenty-six cubits, formed of ivory and gold, standing upright, her tunic reaching to her feet, holding a victory six feet high in her right hand, and a spear in her left; the drapery is of gold; the uncovered parts of the statue are of ivory; the head of Medusa on the breast-plate of the goddess is of ivory; at her feet is her shield; in the convex part of her shield the Amazonian war; in the concave part is the war of the gods and giants; in the base Pandora's history: the gods are here present thirty in number; the Lapithæ and Centaurs are sculptured on her sandals; a serpent at her feet admirably executed; a sphynx on the top, and a griffon on each side of her helmet. The quantity of gold in this statue was forty talents. Plato says the eyes were of precious stones.

There was also, in the citadel of Athens, another statue of Minerva by Phidias, thus described by Pausanias. Of the spoils taken at Marathon from the Persians, Phidias made Minerva's statue of brass, in whose shield the battle of the Lapithæ and Centaurs was engraved by Mys, and painted by Parrhasius, the son of Evenor. The top of the spear, and crest of the helmet, might be seen by those who sail by Sunium.

But the great work of this great master, the astonishment and praise of after ages, was the Jupiter at Elis; thus described by Pausanias. The god is seated upon his throne, made of gold and ivory, a crown of olive branch on his head; in his right hand bearing a Victory, also of ivory and gold; he bears a fillet, and is crowned; the left hand of the god holds a sceptre of various coloured metals, an eagle of gold sitting upon the sceptre; his garment is of gold, and on his garment are wrought animals and flowers, particularly the lily; his sandals also are of gold; the throne is variously ornamented with gold and gems, and also with ivory and ebony: on it animals are painted in their proper colours, and sculptured with great labour. Four victories, as in the dance, are on the hinder feet of the throne, two on each side; and on the front the children of the Thebans taken away by the sphynx; and beneath the sphynxes, Niobe and her children slain by Apollo and Diana; on the frames that join the feet of the throne ornaments are carved; on that in front Hercules warring with the Amazons. Pausanias numbered upon them all together twenty-nine figures. Among Hercules' companions was also Theseus. There were also pillars which adjoined to the feet supporting the throne, equal in size to the feet. There is not an entrance underneath the throne, as under that of Apollo at Amyclis. It is hollow, but the spectator cannot enter, because a wall includes the throne. Of this wall, that part which fronts the door is painted

SCULPTURE.

painted blue; the fides have the pictures of Panæus. Among these is Atlas sustaining Heaven and Earth. Hercules stands near him lifting off his burden. Here are also seen Theseus and Perithous. Græcia and Salamis, two figures; the last of which carries a rostrum in her hand. Hercules' strife with the Nemean lion. Ajax under the reproach of Cassandra. Hyppodamia, daughter of Oenomaus, with her mother. Prometheus bound in chains, Hercules coming to his help; Hercules also, having slain the eagle, which was the punishment of Prometheus on Caucasus, delivering him from his chains. On the hinder part is painted Penthesilea dying, Achilles supporting her. The two Hesperides bearing the apples of which they had the keeping. Panæus, the brother of Phidias, who did these, painted also, in the Pæcile of Athens, the battle of Marathon. Upon the throne, above the head of the god, Phidias carved the Graces and the Hours. Three of them large; these are called daughters of Jove. Upon the feat, lions of gold, and Theseus warring with the Amazons. Upon the base of the throne, which great mass was wrought in gold, are other ornaments relating to the god. The rising Sun in his chariot, and Jupiter and Juno, and by them the Graces; these lead Hermes, and Hermes, Vesta. Cupid also from the sea receiving Venus, who was crowned by Persuasion. Apollo was with Diana, and Minerva with Hercules; and on the lowest part of all was Neptune, and the Moon in her chariot urging on her horses.

The temple at Elis also, which contained this astonishing statue, was itself a noble work of Doric architecture; the architect was Libon, an Elean. The sculptures on the outside of the temple have a relation to the great work within. A gilded Victory crowns the whole. In the front pediment is the contest of the chariot race between Pelops and Oenomaus, and in the back pediment the Lapithæ and Centaurs, with the nuptials of Perithous; and in the temple, and over the doors, the labours of Hercules in very many compositions, which are the work of Alcamenes. The temple has brazen doors and an interior portico, which opens an entrance to the statue of Jupiter; under the statue is inscribed "Phidias, the son of Charmides the Athenian, made me."

It may be proper to take notice in this place, of another temple dedicated to Jupiter Olympius, at Athens, by the emperor Adrian, and in it a colossal statue of ivory and gold, described as not inferior to the colossuses of Rhodes and of Rome.

Pausanias describes also a temple and statue of Æsculapius at Corinth, in the following manner. The statue of Æsculapius is almost half the size of the Olympian Jupiter at Athens. It is of gold and ivory, and is the work of Thrasymedes, the son of Arignotus, a man of Paros. He is seated on a throne, holding a great staff, and with his other hand pressing the head of a serpent; a dog lies at his feet; in his throne the acts of the Argive heroes are sculptured; Belerophon killing Chimæra. Perseus holds Medusa's head cut off. Above the temple are places where those who come to pray to the god repose.

Several other statues of great excellence, both in marble and bronze, are mentioned among the works of Phidias, particularly a Venus, placed by the Romans in the forum of Octavia. Two Minervas, one furnished Callimorphos, from the beauty of its form; and it is likely that the fine statue of this goddess in Mr. Hope's museum is a repetition in marble of Phidias's bronze, from its resemblance to the reverse of an Athenian silver coin, in attitude, drapery, and helmet. Another statue by Phidias was an Amazon, called Eucnemon, from her beautiful leg; of which there is a print in the Museum Pium Clementinum.

Alcamenes was celebrated for his Venus Aphrodite, to which Phidias is said to have given the last touches.

Praxiteles excelled in the highest graces of youth and beauty: Pliny says he not only excelled other sculptors by his marble statues in the Ceramicus at Athens; but his Venus was preferable to theirs, and all other statues in the world, to see which many failed to Gnidos. This sculptor having made two Venuses, one with drapery, the other without; the Coans preferred the clothed figure, on account of its severe modesty. The same price being set upon each, the citizens of Gnidos took the rejected statue, and afterwards refused it to king Nicomedes, who would have forgiven them an immense debt in return; being resolved, says our author, and with reason, to suffer any thing, so long as the statue of Praxiteles ennobled Gnidos. The temple was entirely open in which it was placed; because every view was equally admirable. The figure is known by the descriptions of Lucian and Cedrenus; and it is represented on a medal of Caracalla and Plautilla, in the cabinet of France. This Venus existed in Gnidos during the reign of the emperor Arcadius, or about 400 years after Christ.

This statue seems to offer the first idea for the Venus de Medicis; which is likely to be the repetition of another Venus, also the work of this artist, mentioned by Pliny.

On the reverse of the empress Lucilla's medals, is a clothed Venus, with an apple in her right hand; which, from the grace of its attitude, and its resemblance to several antique marble statues, is likely to be the clothed Venus chosen by the Coans.

Among the known works of Praxiteles, are his satyr, cupid, Apollo, the lizard-killer, and Bacchus leaning on a fawn.

The celebrated Venus of Gnidos was found, about eighteen years since, in the neighbourhood of Rome, which was afterwards the property of duke Braschi, nephew of the late pope Pius VI.

Polycletus of Sicyon, the scholar of Agelades, was particularly celebrated on account of his Doryphorus, or lance-bearer; and Diadumenus, or youth binding a fillet round his head. This statue was valued at an hundred talents. The Doryphorus was called the Rule by artists, from which they studied.

The Discobolus of Myron is ascertained by an antique gem, and the description of Quintilian, who apologizes for its forced attitude. An ancient example of this figure is in the British Museum.

The Discobolus of Naucydas is uniformly admired for its forms and momentary balance.

The wounded man, in which might be seen how much of life remained in him, was the famous work of Ctesilaus, and perhaps is the same as the statue commonly called the Dying Gladiator, but more properly a dying herald, or hero, according to Winckelman.

Ctesilaus, or Desilaus, is known by his wounded Amazon.

Pliny mentions the nine muses by Philiscus of Rhodes; and the muses also, brought by Fulvius Nobilior to Rome. From one of these series must be the greater number of those formerly in the pope's museum, now in the gallery of France, of which the Comedy is remarkable for grace, and the Tragedy for grandeur.

The Hermaphrodite of Polycles is one of the most delicate and graceful productions of antiquity.

The Apollo Phileus, or in love, by Canachus, is witnessed by many fine repetitions in the different galleries of Europe.

The Ganymede, borne in the eagle's talons, is exactly described by Pliny. An example of this work exists in the pope's museum.

SCULPTURE.

The Apollo Belvidere is believed, by the learned Visconti, to be Apollo Alexicacos, the deliverer from evil, the work of Calamis; mentioned both by Pliny and Pausanias; and the history of its removal is given in the *Museum Pium Clementinum*. Only one small antique repetition of this statue is to be found; and indeed admirable and sublime in its beauty as it is, there is a reason which might render it less popular among the ancients than the moderns. Maximus Tyrius describes a statue by Phidias very similar to this, but in greater motion, either discharging an arrow, or preparing to do so. (Tozon.) There are traces of this statue in some ancient bas-reliefs; and it is possible the stronger expression of Phidias's work, together with the authority of his name, might have diminished the public attention to Calamis in a comparative production.

The Venus de Medicis was so popular a favourite among the Greeks and Romans, that a hundred ancient repetitions of this statue have been noticed by travellers. The individual figure is said to have been found in the forum of Octavia. The style of sculpture seems to be later than Alexander the Great: and the idea of this statue seems to have its origin from the Venus of Gnidos.

We may now notice some statues of great excellence, which Pliny has not mentioned. And no wonder they are omitted, when of more than 11,000 reckoned in his history, he professes to give a catalogue of about 500 only.

The colossal statues on Monte Cavallo in Rome we may fairly presume to be the works of Phidias and Praxiteles, as inscribed on their pedestals; because the animated character and style of sculpture seem peculiar to the age in which those artists lived; and because, in the frieze of the Parthenon there is a young hero governing a horse, which bears so strong a resemblance to those groups, that it would be difficult to believe it was not a first idea for them by one of those artists.

The heroic statue by Agasias the Ephesian, commonly called the Fighting Gladiator, is shewn by the ingenious and learned Abbatte Fea, to be Ajax, the son of Oileus, as his figure is so represented on the coins of Locris, his country.

The Hercules Farnese was evidently one of the first favourites of antiquity, from its frequent repetitions in bronze and marble, gems and coins. Its history, according to these, seems to be this. The city of Perinthus was twice besieged by Philip of Macedon; the citizens, however, by the strength of their situation, their own valour, and the intervention of friends, preserved their liberty. As their city was dedicated to Hercules, they represented him on their coins resting from his labours. The standing figure is the Hercules Farnese, which, on the coin, was copied, as usual, from an honoured statue in the city; most probably from the work of Glycon the Athenian, whose country once delivered them from the oppression of Philip. The style is later than the time of Alexander.

We shall now proceed to those precious monuments of art, the ancient groups; in which we see the sentiment, heroism, beauty, and sublimity of Greece, existing before us.

The group of Laocoon, animated with the hopeless agony of the father and sons, is the work of Apollodorus, Athenodorus, and Agasander of Rhodes. The style of this work, as well as the manner in which Pliny introduces it into his history, give us reason to believe it was not ancient in his time.

Zethus and Amphion, tying Dirce to the bull's horns, an example of filial vengeance for a persecuted mother, is as heroic in conception as vast in execution. The restorations of this group are so bad, that they only become tole-

rable by something like an assimilation of spirit in their union with the ancient and venerable fragment. It is the work of Apollonius and Tauriscus of Rhodes.

The group of Hercules and Antæus, in the Palace Pitti at Florence, may be a marble, from the bronze of which the copyist inscribed the name of the original artist.

The groups of Atreus, bearing a dead son of Thyestes; Orestes and Electra; Ajax supporting Patroclus; are all examples of fine form, heroic character, and sentiment. There seems only to be one reason for their being omitted by Pliny, that they were too recent at that time to have obtained an equal rank in public estimation with the fine works of Phidias and Praxiteles, and their immediate descendants.

The group of Niobe and her youngest daughter, by Scopas, is an example of heroic beauty in mature age. The sentiment is maternal affection: she exposes her own life to shield her child from the threatened destruction.

The separate statues of the children all partake of the same heroic beauty, mixed with the passions of apprehension, dismay, or death.

To this series belongs that fine example of anatomical study, in difficult but harmonious composition, the group of The Boxers.

The beautiful and interesting group of Cupid and Psyche is not mentioned by Pliny, perhaps for the same reason that several other fine works are not noticed, because it was after the times of those great masters who were looked on as the standard of excellence in his days. It is most likely to have been produced after the reign of Augustus, when the Pythagorean philosophy was revived, from which its subject is taken.

From what has been said, it will appear sculpture did not arrive at its maturity until the age of Phidias, 490 years before the Christian era; and Pliny's catalogue of the most celebrated Greek artists continues 160 years later, or to 330 years before Christ. After which time, however, the Laocoon, and several of the finest groups and statues, seem to have been executed: nor can we believe, from the admirable busts and statues of the imperial families still remaining, that sculpture began to lose its graces until the reign of the Antonines: and, indeed, so strong were the stamina of Grecian genius in the art of design, that after the time of the Iconoclasts in the fifth and sixth centuries, when the noblest works were destroyed, when great works of sculpture were not required, even then, and until Constantinople was taken by the Turks in the 15th century, the Greeks executed small works of great elegance, as may be seen in the diptychs, or ivory covers to consular records, or sacred volumes used in church service.

The works of sculpture, here enumerated, will also shew, that almost all the greatest and most valued productions were of marble, and not bronze, as some have been inclined to believe. And although several of the statues mentioned by Pliny were bronze, from which we have marble copies, yet all the groups, with two or three exceptions only, are marble; and some of the most celebrated statues, as the Venuses, and the Cupid by Praxiteles, with many others.

The principal schools of sculpture were Athens and Rhodes. The sculptors of the Laocoon, and the Toro Farnese, and the Colossus, were Rhodians; and it is almost incredible, that from this little island, only forty miles long, and thirteen broad, the Roman conquerors brought away 3000 statues. But we shall more readily believe this when we recollect that the force and enterprise of these islanders were sufficient to conquer the navy of Antiochus, commanded by Hannibal.

Sicyon had long been the work-shop of metals of all countries.

SCULPTURE.

countries. Egina was also famous for bronze sculpture, and continued the Egyptian style.

Etruscan sculpture must be considered entirely the work of Greek colonists and their disciples.

The Sicilian sculpture is also Grecian. Some of their finest medals in particular are of the Corinthian school.

As the enterprise and taste of the present age have rescued two noble examples of Grecian sculpture, the pediments of the temple of Jupiter Panellenius, in the island of Egina, and the frieze which surrounded the interior of the temple of Apollo Epicuros at Phygaleia, it may be proper to give some description of them in this place.

The figures, which were decorations of the east and west pediments of the temple of Jupiter Panellenius, were found among the ruins, nearly under the site in which they had been originally placed: their number was nine in the west pediment; that in the centre was the figure of Minerva; the rest seemed to be combatants, as well in this pediment as the six figures in the east pediment. On each side of an ornament, in the centre of the west pediment, were two female figures; and at each corner of the pediment the remains of a griffon. The statues were in size small nature; and, according to Pliny's description, partaking of the Egyptian style of workmanship.

Among the ruins of the temple of Apollo Epicuros at Phygaleia, in the Argolis, were discovered, in many pieces, the frieze which adorned the interior of the temple. They represented the battle of the Athenians with the Amazons, and the Lapithæ with the Centaurs. The compositions are grand and energetic; the actions are natural, original, and elastic; the lines of the bodies and limbs are beautifully variegated by the draperies, as flowing from the motion of the figures, or flourished in the air by impulse of wind; the beauty of the figures and countenances is heroic; and the general style and character of the work resemble the alto-relievos in the temple of Theseus. The figures are about two feet high; and the whole extent of the different basso-relievos, taken together, about ninety feet.

Of Roman Sculpture.—The earliest inhabitants of Italy, without doubt, practised the same kind of barbarous art, which is common in all early stages of society; but the accounts given by Herodotus, Diodorus Siculus, and other Greek writers of indisputable authority, concerning the emigrations of Greeks into Italy, who settled in that part which has been called Magna Grecia, comprehending nearly the whole western coast of that country, together with the evidence of nearly every work of art which has been discovered within those limits, prove satisfactorily, that all the early painting and sculpture, worthy to be called so, are properly colonial Greek, either the production of Greek artists themselves, or of natives who were their scholars.

We may observe upon their coins, that they all seem to have been derived from the earliest coins and weights of Greece. Their earliest cast money or weights, signed with an ox, lead to a strong suspicion that they were imitations of similar weights alluded to by Homer, which had relation to the value of an ox. Their cast coins or weights are also marked with the head of Janus, with two faces on one side, and the prow of a ship on the other; but it is to be observed that this double-faced Janus, when bearded, is only an imitation of the Greek heads of Jupiter, or the eastern Bacchus, who, according to the earliest systems of philosophy, sees that which is past and that which is to come. When the head of Janus is without a beard, it sometimes seems to be a copy of the head of Hercules, and sometimes of Mercury: and in order to leave no chance of being deceived in the personage, he is represented with the petasus or hat upon his head, as well in the double as in the single head; besides which, all

the divinities represented on such coins or cast weights, are but copies from well-known heads of Grecian divinities, as Jupiter, Hercules, Mercury, Ceres, &c.; and by far the greater number of them from Grecian heads of those divinities not earlier than the time of Phidias.

Concerning their painting, though it may be difficult to make the same assertion so positively and so extensively as that concerning their coins; yet we must assert that the subjects of their painting, whether on walls or earthen vases, represent Greek philosophy, Homeric persons and stories; scenes from the Greek tragedians or Grecian sacred rites; and that the supercriptions to those paintings are written in Greek, expressing Greek names of the artists who painted, or the persons represented.

The sculpture also which has been called Etruscan has the same Grecian characteristics with the paintings; to which we may add, in many instances, that it represents Grecian arms and dresses.

The accounts given by Pliny of the figures of the Roman kings, and other illustrious persons of early times in the Capitol, together with the Terra Cotta figure of Jupiter Capitolinus; were from the Grecian schools of art established in Etruria; and such were all the works of painting, sculpture, and architecture, executed for the early Romans, who do not appear to have possessed any works of magnificence or distinguished merit, before the Scipios introduced them to an acquaintance with Grecian arts and letters.

After the enormous ravages and barbarities of Mummius at Corinth, and Sylla at Athens, the Romans ingrafted taste on rapine, and exhibited an inordinate cupidity and ostentation for works of fine art, which passed in some instances for patronage. They filled their palaces, villas, theatres, and public places with the spoils of Greece.

Although some general heads of Greek art have been already delivered in this dissertation, yet as Pliny the Elder's writings contain such satisfactory accounts of Etruscan, Italian, and Grecian sculpture, it will be highly proper to give the English reader these accounts in his own words, which were collected from the writings and treatises of the ablest and most learned artists among the ancients. Pliny's Natural History, l. xxxiv. c. 7.

The statuary art was familiar in Italy in ancient times, as is shewn by a Hercules consecrated by Evander, as it is said, in Foro Boario; which is called the Triumphal, by his having on the triumphal habit: besides the double Janus dedicated by king Numa, which expresses peace and war, and by its fingers signifies the number of days in the year, the god himself indicating the times and seasons of the year. There are also Tuscan statues dispersed very widely, which there is no doubt were made in Etruria; such were also believed to be their gods, except by Metrodorus Scepius, which surname was given to him through the hatred of the Romans; for two thousand statues, when the Volscians were conquered, were dispersed abroad. We have wondered to see the original statues of ancient Italy, of wood perhaps, or modelled in clay, the images of gods dedicated in temples until the conquest of Asia, from whence came luxury.

It will be proper to speak of the first origin of expressing likenesses in that kind which the Greeks call modelling, and that it was prior to statuary. This would extend to infinity in a work of many volumes, if any person should follow up the subject: every one does what he is able.

When Scaurus was edile, three thousand statues made the scene of a temporary theatre. Mummius, when he conquered Achaia, filled the city; but dying, left his daughter without a dowry, which was inexcusable. Lucullus brought many; from Rhodes there are as many as three thousand statues.

Mutianus,

SCULPTURE.

Mutianus, thrice consul, brought not fewer from Athens : from Olympia and Delphis, it is believed, a greater number.

What mortal can recount those which are most distinguished or noted for some reason or other ; indeed, to have named the distinguished artists would be a pleasurable task. Their number also is infinite, when Lyfippus alone produced to the number of 610 works, which were all famous ; their number appeared at his death, when his heirs opened his treasures ; he was used, on receiving his payment, to deposit a golden denarius for every work. The art, in the success of its darings, is elevated above human faith. One example of this success we shall offer : the similitude expressed is not of God nor of man. Our age saw in the Capitol, before it was consumed in the fire of Vitellius's times, in the chapel of Juno, a dog of brass, licking his own wound, whose most wonderful and unequalled verisimilitude suggested the reason why it was dedicated : the life of its keepers was pledged for its safety. Innumerable are such daring examples of art : masses have been devised equal to towers. Statues which are called Colossuses, such is Apollo in the Capitol, brought by M. Lucullus from Apollonia, a city of Pontus, of 30 cubits : its expence was 500 talents. Such, in the Campus Martius, is the Jupiter dedicated by Claudius Cæsar, which is called the Pompeian, from its vicinity to Pompey's theatre. Such is that at Tarentum, made by Lyfippus, of 40 cubits ; admirable in this, the hand being stretched out and in danger of being broken by the stormy wind ; the artist therefore provided, it is said, within a little interval, an opposing column, to prevent a great wind from breaking his work. Consequently, because of its magnitude, and the labour required, Fabius Verrucosus did not meddle with it at the time he brought from hence the Hercules which is in the Capitol. But above all, as objects of admiration, was the Colossus of the sun of Rhodes, by Chares the Lindian, the disciple of Lyfippus before mentioned, 70 cubits in height. This statue, after 56 years, was thrown down by an earthquake, but lying prostrate it was still a wonderful spectacle ; few could clasp round its thumb ; its fingers were larger than whole statues. The vast caverns of its broken members were displayed within great masses of stone, whose weight kept it steadfast. Twelve years it was in making, at the expence of 300 talents, which were supplied by king Demetrius, being interrupted by the tediousness of delay. There are other less Colossuses in this city, 100 in number, each of which would ennoble the place wheresoever it was fixed. Besides these were those of the five gods made by Bryaxis, who made many Colossuses in Italy, in particular an Apollo, which is seen in the Tuscan library of Augustus, 50 feet high, of fine brass, and exquisite workmanship. Sp. Carvilius made a Jupiter, which is in the Capitol, from the breast-plates, helmets, and greaves taken from the Samnites, of an amplitude to be seen from the temple of Jupiter Latiaris. The rest of the figures which are before the feet of the statue, are also from his file. Two heads also are admired in the same Capitol, which P. Lentulus, the consul, dedicated, one made by Chares above spoken of, the other by Decius, overcome in the comparison to that degree, as seemed by no means probable, according to the works of the artist. But in statues of that kind, Zenodorus in our age has excelled. He made a Mercury in the city of Gallia Arvernus, the labour of ten years, which was afterwards so approved, that he was called to Rome by Nero, where he was desired to make the colossal statue of that prince 110 feet high, which should be dedicated to the sun, by way of reverence, and which is among the atrocities of this prince. It is wonderful that in his workshop there does not remain any clay model of this

work of a large size, but there are many first sketches in small, like first attempts. This statue indicates that the art of founding in brass is perished.

Nero had prepared liberally both gold and silver, and Zenodorus in modelling and carving is not considered as inferior to any of the ancients. When he had finished the statue for the Arvernians, Vibius Avitus, being the president of that province, two cups were sculptured by the hand of Calamis, which Germanicus Cæsar highly valuing, gave to his preceptor, Cassius Syllanus, his uncle. As much as the excellence of Zenodorus was greater, so much may be found the decay in works of brass.

The statues which are called Corinthian are for the most part such as may be carried from place to place. Such was that of the Sphynx, which Hortensius, the orator, received as a present from Verres, and occasioned a reply from Cicero. When Hortensius said, in altercation with him, " I do not understand your enigma ;" Cicero replied, " You ought, for you have the Sphynx at home." Nero, the emperor, it is said, took about with him a statue of an Amazon. And a little before our time, C. Cestius, the consul, always carried an image with him in the field of battle. Alexander the Great had a tent sustained by four single statues, of which two are now dedicated before the temple of Mars the Avenger, and the other two before the palace. The art is ennobled by almost innumerable lesser statues. Before all, Phidias the Athenian made a Jupiter of ivory and gold. He also made statues in brass. He flourished in the 84th Olympiad, about 300 years from the building of Rome. In the same period his emulators were Alcámenes, Critias, Nestocles, and Hegias. Afterwards, in the 87th Olympiad, Agelades, Callon, Polycleus, Phradmon, Gorgias, Lacon, Myron, Pythagoras, Scopas, and Parelus. Among these, Polycleus had for his disciples Argius, Asopodorus, Alexis, Aristides, Phrynon, Dimon, Athenodorus, Dameas, and Myron. In the 95th Olympiad flourished Naucydes, Dinomenes, Canachus, and Patrocles. In the 102d, Polycles, Cephissodorus, Leochares, and Hypatodorus. In the 104th, Praxiteles and Euphranor. In the 107th, Echion and Therimachus. In the 114th was Lyfippus, in the time of Alexander the Great ; and at the same time Lyfistratus and his brother Sthenis, Euphronides, Sostratus, Ion, Silanion, who was admirable, none being more learned. He had for disciples Zeuxis and Jades. In the 120th Olympiad, Eutyichides, Euthykrates, Dahippus, Cephissodorus, Timarchus, and Pyromachus. The art then ceased. And again, in the 125th, revived, though allowed to be inferior, yet approved ; Antæus, Callistratus, Polycles, Athenæus, Callixenus, Pythocles, Pythias, and Timocles. We shall pass hastily over the most distinguished of the celebrated artists in their distinct ages. A Venus was made with a kind of emulative contention, as formerly they made an Amazon, which was dedicated in the temple of Diana, at Ephesus : that work was approved which every artist judged to be next in merit to his own. This was the work of Polycleus ; the next was Phidias, the third Ctesilaus, the fourth Cydon, the fifth Phradmon. Phidias, besides the Jupiter Olympius, which no one attempted to rival, made also, from gold and ivory, Minerva at Athens, which stands in the Parthenon. Of brass, also, before that Amazon just mentioned, he made a Minerva of supreme beauty, from which it received the name of Callimorphos. He made also Cliduchus, or the key-bearer, and another Minerva, which Æmilius Paulus dedicated at Rome in the temple of Fortune. Also two statues clothed in the pallium, which Catullus dedicated in the same temple, and another which was colossal, naked. He first discovered the art of alto relievo, and demonstrated its merit. Polycleus of Sicyon was the disciple of Agelades ;

SCULPTURE.

lades; he made a statue of tender youth, called Diadumenus, from his binding on a garland, valued at one hundred talents. Also one called Doryphorus, from his carrying a spear, a youth in the vigour of his age. He made also what by artists was called the Rule, seeking the lines of art from it as from a certain law. He was the only man who made art its own judge. He also made a strigilist, and one throwing a die; also two boys at the dice, which are called Astragalizontes; they are in the emperor Titus's court. No work is judged to be more perfect than this. Also a Mercury, which belonged to Lyfimachus, and Hercules sustaining Antæus from the earth, which is at Rome; also Artemon, an effeminate voluptuary, who was called Periphoretos, from his being borne about in his couch. He was judged to have perfected the science. He was also highly skilled in alto relievo, which had been first discovered by Phidias. But what was peculiarly his own, he found out the balance of the figure on one leg; notwithstanding, as Varro reports, his figures were squared, and all imitated from one example. Myron, born at Eleutheria, the disciple of Agelades, was very famous for a heifer, praised in celebrated verses, whereas many are commended more by the ingenuity of others than their own. He made a dog and Discobolus; Persea, sea-monsters, and a satyr admiring the pipes; a Minerva; a Pentathlos, or master of the five exercises; a pancratiast or boxer; a Hercules also, which is at the Circus Maximus of Pompey the Great. He made also the monument of a grass-hopper and locusts, to which Erinna refers in her verses. He made also Apollo, which the triumvir Antony took away, but it was restored to Ephesus by Augustus, admonished for this purpose in a dream. No artist, for multitude or variety, surpassed Polycletus, or was more accurate in symmetry; but although he was so curious in the representation of bodies, he did not express the feeling of the soul. The hair also, and the pubes, he made like the rude ancient work. Pythagoras of Rhegium surpassed him in a Pancratiast, placed in Delphi; and also Leontinus, who made the pedestrian Astyleon, which is shewn at Olympia, with Libys, the boy holding tablets, and one bearing apples, naked; a Syracusan, also lame, the sufferings of whose ulcer affect the beholder; also Apollo the harper, the serpent slain with his arrows, which is called Dicaeus, and which was taken from Thebes by Alexander. He first expressed the nerves and veins, and the hair also with accuracy.

There was another Pythagoras of Samos, at first a painter, whose statues of the seven goddesses naked, and an old man, are very much praised. This artist was said to have been indiscriminate in the likeness of the face. The disciple of Rheginus is said to have been his sister's son, called Softratus. Whereas Tully affirms, that Lysippus was his disciple, which Duris denies. He first became a worker in brass, from hearing the answer of Eupompus the painter, who being questioned who should be followed of those before his time, answered, shewing a multitude of men, that nature should be imitated, not the artist. It is said that he made more statues than others, being most prolific in his art; among which is a man using the strigil, which Marcus Agrippa placed before his baths. This was very much admired by the emperor Tiberius, who, not satisfied with it where it was, had it brought into his chamber, and another statue put in its place, at which the people of Rome were moved to resentment, and demanded it to be restored, which was done. Lysippus made a drunken piper, a hunting dog, and a chariot and four horses, with the fun of Rhodes. He made also Alexander the Great in many works, beginning from his childhood, with a statue of whom the emperor Nero being very much delighted, commanded it to be covered with gold; but afterwards, when the art was dis-

covered to be destroyed by it, it was taken off; and it was esteemed more precious with the cuts and scars remaining in the work to which the gold adhered. He made also Hephaestion, Alexander the Great's friend, which has been ascribed to Polycletus, who was 100 years before him. Also Alexander hunting, which is consecrated at Delphos, and at Athens a crowd of satyrs: of Alexander's friends he made the strongest resemblances. Metellus, when he conquered Macedonia, brought them to Rome. He made also chariots with four horses, of many kinds. He added much to the art of statuary, expressed the hair, made the head less than the ancients, the body more slender and dry than the ancients made theirs, by which the magnitude of the statues appeared enlarged. The Latins have not the word symmetry, which he most accurately observed, by a new and untried rule in changing the squared statues of the ancients; he said they made men as they are, he made them as they appear to be. He left sons and disciples very much admired artists, such as Dahippus and Bedas; but above all, Euthycrates, although he emulated rather the constancy of his father than his elegance, and was pleased with the austere rather than the agreeable. Therefore he best expressed the Delphian Hercules, and Alexander, Theseus the hunter, and Theseiades, a battle of horsemen before Trophonius's oracle, chariots and four horses, many statues of Medea, horsemen, and hunting dogs. His disciple was Tisicrates the Sicyonian, the nearest to Lysippus of all his followers, so that their statues are scarcely distinguishable; a Theban old man, king Demetrius, Peucestes, Alexander the Great's preserver, worthy of so much glory. Artificers, who have brought these things together in the volumes they have composed, celebrate Telephanes the Phocæan, unknown on other accounts, because in Thebes, where he dwelt, his works are concealed; otherwise by the suffrages of others he is equal with Polycletus, Myron, and Pythagoras. His Larissa is praised, and his Wrestler with the thorns, and his Apollo. Some think he had no other merit, but that he gave his workshops to Xerxes and Darius. Praxiteles was also particularly happy, and also celebrated in his works of marble. He made also in brass beautiful works; the rape of Proserpine, the Sybil or prophetess, and the drunken woman, Bacchus, and a most famous satyr, which the Greeks call Periboeton: statues also which were before the temple of Felicity, and a Venus which was consumed in the fire of Claudius's palace; his marble, famous through the earth, was equalled by himself only. Also statues called Strophusa, Spilumene, Oenophorus, Harmodius and Aristogiton, the Tyrannicides; which were taken by Xerxes, the Persian king, and were sent back to Athens by Alexander. He made also a youth, stealing upon a lizard, which he approaches to strike with an arrow: it is called Sauroctonon. He made two statues, expressing opposite effects, a mourning matron, and a rejoicing harlot: they think this to be Phryne, discovering in her the love of the artist, and the reward of the woman: this statue possesses much grace. Calamis made a charioteer with four horses: in his horses are never found any defect, though he is thought to be defective in his men. The same Calamis made other chariots, both with four and with two horses, in which the men are not inferior. Nothing is nobler than his Alcmena. The disciple of Phidias, Alcamenes, worked in marble; also in brass he made a Pentathlon, who is called Encrinomenos. But Aristides, the disciple of Polycletus, made chariots both with two and four horses. And Laena, by Iphicrates, is praised. This is the harlot who in the lyre and song was the familiar of Harmodius and Aristogiton, and partook of their counsel in the Tyrannicide. She was tortured to death, and did not betray them to the tyrant; wherefore the Athenians willingly hold her in honour, not that

SCULPTURE.

that they celebrate her as an harlot, but they have made an animal of her name; and that the cause of the honour might be understood, they forbade the artist to add the tongue. Bryaxis made Æsculapius and Seleucus; Bedas made Battus adoring Apollo, and a Juno, which are at Rome, in the temple of Concord. Ctesilaus made a wounded man fainting: in which might be understood how much life remained; and an Olympian Pericles, worthy of the epithet. He was admirable in his art, and noble men he made more noble. Cephissodorus made in the Athenian port an admirable Minerva, and an altar to the temple of Jupiter the saviour, in the same port, with which few can be compared. Canachus made an Apollo naked; it is called Philæus in Didymæus: it is of the Æginetic mixture of brass. Also, a deer suspended in his steps, that a line might be drawn under his feet, retained only in the alternate bite of his hoofs and heel, so that turning about his teeth to both parts, he starts from the repulse of his action by turns. He made also Celetizontes, or boys holding hatchets. Chæreas made Alexander the Great and Philip his father. Ctesilaus, or Desilaus, made a Doryphoron and a wounded Amazon. Demetrius made a Lyfimachus, who was priest of Minerva sixty-four years. He likewise made a Minerva, which is called the Musical; because the serpents in her Gorgon resound to the stroke of the harp. He also made Simenes, the horseman, who first wrote on horsemanship. Dædalus made, among his famous works, two boys using the strigil. Dinomenes made Protefilaus and Pythodæmus the wrestler. Euphranor's work is Alexander Paris, in which is praised what is intelligible at once; the judge of goddesses, the lover of Helen, and also the slayer of Achilles. His is the Minerva at Rome, which is called Catuliana, being dedicated in the Capitol by Quintus Lutatius Catulus; also the statue of Good Fortune; in his right hand holding a patera, and in his left a spike of corn and a poppy. Also Latona, the child-bearer, in the temple of Concord, sustaining in her arms Apollo and Diana. He made also a chariot with four, and another with two horses: also Cliduchon, or the key-bearer, of the most perfect form; also a Virtue, and Græcia, both of them colossal; also a woman, admiring and adoring; and Alexander and Philip, in a chariot and four horses. Euty-chides made Eurotas, in which many saw that art was more liquid than the river itself. Hegias made Minerva, and king Pyrrhus, highly praised; and Celetizontes, boys; and Caltor and Pollux, before the temple of Jupiter the Thunderer. In the Parian colony is the Hercules of Isidorus. Eleutherus, the Lycian, was Myron's disciple, who made (worthy of his preceptor) a boy, blowing the languid fire; and the Argonauts. Leochares made an eagle, who understood what he took away in Ganymede, and what he bore, scarcely touching the rest with his talons; also the boy Autolyceus, victor in the Pancratium, on whose account Xenophon wrote his Symposium; Jupiter also, thundering in the Capitol, praised above all; also Apollo with a diadem. Lyciscus made the boy Lagon, cunning, false, and impudent. Lycus made a boy offering incense. Menechmus made one, with his neck bended, and his face pressing his knee: this Menechmus wrote of his art. Naucydes made Mercury, and a Discobolus; and, as it is thought, a person sacrificing a ram. Naucerus made a wrestler, drawing his breath. Niceratus made Æsculapius and Hygeia, which are in the temple of Concord at Rome. Pyromachus made a chariot with four horses, governed by Alcibiades. Polycles made a Hermaphrodite, a noble work; Pyrrhus, Hygeia and Minerva; Phoenix, the disciple of Lysippus, Epitherses; Stipax, the Cyprian, one celebrated statue, an augur; here was the slave of the Olympian Pericles burning the entrails of a sacrifice, with a full mouth blowing the fire. Silanion made

Apollodorus the most accurate among all in the art, and his own inimical judge, breaking the scarcely perfect statue, because he was unable to satisfy his own wishes in the art, and he was therefore surnamed the Madman: in this he expressed not the man made of brass, but rage itself; a noble Achilles he also made, and Epistate exercising the athletæ. Strongylion made an Amazon, which, from the beauty of her leg, was named Eucnemon: the emperor Nero always carried it with him; he also made a boy, whom the love of Brutus of Philippi rendered illustrious with his name. Theodorus, who made the labyrinth at Samos, cast his own likenesses in brass: besides the admirable resemblance, it is celebrated for the delicacy of its execution; the right hand holds a file and the left a square; it was taken to Præneste. He also composed a car and driver, so small, that they might be covered with the wing of a fly. Xenocrates, disciple of Tificrates, or, as others say, of Euthykrates, excelled, both in the number of his statues, and composed volumes on his art. Many artists made Attalus and Eumenes fighting against the Galatians. Isigonus, Pyromachus, Stratonicus, and Antigonus, composed volumes on the art. Boethius, although more excellent in working silver, made a most beautiful infant strangling a goose. But of all the works I have mentioned (says Pliny), the principal were dedicated by the emperor Vespasian in the temple of Peace, and his other buildings, being brought together by the rapine of Nero into the city, and disposed in situations in his golden house. Besides, there are other artists equal in their merits, but none of their works are pre-eminent; Arifton, who was used to work in silver; Calliades, Ctesias, Cantharas of Sicyon, Dionysodorus, disciple of Critias, Deliades, Euphorion, Eunucus, and Hecataeus. Among the sculptors in silver were Lesbocles, Prodonus, Pythodicus, Polygnotus; these were noble painters; also among the sculptors in silver; Stratonicus and Scymnus, who was the disciple of Critias. Pliny then enumerates those who made works of this kind, as Apollodorus, Androbulus, Asclepiodorus and Alevas, who made philosophers; Apellas made adoring females; Antigonus and Peryxiomenon made the Tyrannicides above spoken of; Antimachus and Athenodorus made noble women; Aristodemus made wrestlers, and a chariot with two horses, with their charioteer; philosophers; an old woman, and king Seleucus; his Doryphorus also is a graceful work. There were two of the name of Cephissodorus; the first made Mercury feeding the infant Bacchus; he made also an orator, with his hand raised up, but the person is uncertain; the other represented philosophers. Colotes, who worked with Phidias on his Olympian Jupiter, represented philosophers; also Cleon and Cenchramis, and Chalcicles, and Cephis. Chalcothenes made a comedian, and an athleta; Dahippus made a strigilist; Daiphron, Democritus, and Dæmon, the philosophers. Epigonus excelled almost all the rest already recorded, in his imitation of a trumpeter, and a mother piteously embracing her slain infant; and Eubolis counting by his fingers. Mycon made a beautiful Athleta; Menogenes a chariot and four horses. Nor was Niceratus inferior to them all, representing Alcibiades in his attack; and Demaratus sacrificing; his mother lighting a lamp. Tificrates made a chariot and two horses; Pitho placed a woman upon it; also he made Mars and Mercury, which are in the temple of Concord at Rome. Perillus, whom no one prizes, more cruel than Phalaris the tyrant, made a bull, in which he promised that a man, by the power of fire, might be compelled to bellow, but he himself, by a more just act of cruelty, was made to experience it. Thus a most humane art was called away from the similitudes of gods and men. Was it for this that so many laboured to rear an art that it might become a torment?

Therefore

SCULPTURE.

Therefore one cause of preserving his work was that, whoever should see it might hate the hand that produced it. Sthenis made Ceres, Jupiter, and Minerva, which are at Rome, in the temple of Concord; also matrons weeping, and adoring, and sacrificing. Simon made a dog and an archer. Scopas worked in all kinds; athletes, and foldiers, and sacrificers. Batton, Euchires, Glaucides, Heliodorus, Hicanus, Lophon, Lyfon, Leon, Menodorus, Myiagrus, Polycrates, Polydorus, Pythocritus, and Protogenes, who were famous in painting. Patrocles, Polis, Posidonius, who also carved excellently in silver; they were Ephesians. Periclymenus, Philon, Simenus, Timotheus, Theomnestus, Timarchides, Timon, Tifias, Thrafon; among all these the most known and remarked is Callimachus, always his own calumniator, nor did he set any limit to his accuracy; hence he was called Cacizotechnos: he exhibited memorable examples of his excessive attention. His are the dancing Lacedæmonian females, an over-laboured work, in which all the grace was taken away by the accuracy; he also, as it is said, was a painter. One statue alone of Zeno, Cato in his expedition to Cyprus, did not sell: not gratified with the brass, nor with the art; but because it was the portrait of a philosopher; this we observe by the way, although it may turn out an useless example. One statue we must mention and not pass over, though the author is uncertain; near the Rostrum at Rome, a Hercules, clothed in a tunic of the Elean habit, with a frowning face, as suffering in the highest degree from the tunic. On this are three inscriptions, L. Lucullus, imperator, from his spoils; the other is the son of Lucullus, a minor, from senatus consultum; the third is, T. Septimus Sabinus, a curule edile, from his private property restored to the public. This statue was thought worthy of such a distinction. Pliny, l. xxxiv. c. 19, &c.

Dibutades, a Sicyonian potter, first found the art of making likenesses of clay, in Corinth, by the help of his daughter, who being in love with a youth who was going on a journey, scored lines round the shadow of his face by a lamplight on a wall, which her father impressing with clay, made a type, or cast, and with the rest of his pottery placed to be hardened in the fire. It was preserved in the Nymphæum till Mummius overturned Corinth, as it is said. There are those who say that Rhæcus and Theodorus first found out modelling in Samos, before the Battades were driven from Corinth. Demaratus fled from that city, and in Etruria was the father of Tarquin, the first king of the Romans; he was accompanied by Euchira and Eugrammus, the modellers; by these modelling was first brought into Italy. Painting them red, or making them of red clay, was first practised by Dibutades; he is the first who added masks to the extremities of tiles which threw off the showers, which at first were called prototypes; afterwards he made ectypes, or moulds of them; hence arising to the top of the temple, they were named models. The likeness of man was taken from the face itself in plaster; and wax was produced in that form as poured into the plaster. Lyfistratus, the brother of Lyfippus the Sicyonian, improved this invention; he first determined the representation of portraits; for before him, they endeavoured to make them as handsome as possible. He did the like in his statues. Such improvements were made that no statue was produced without a model. It appears, therefore, that this art was more ancient than casting in brass. Damophilus and Gorgafus were very eminent modellers; they were also painters, who exercised both arts: in the temple of Ceres at Rome, and in the Circus Maximus, there are verses inscribed in Greek, which signify that the work on the right hand was that of De-

VOL. XXXII.

mophilus, and on the left that of Gorgafus: before this all the work in this temple was Tuscan, as M. Varro says. From this temple, when it was restored, the surface of the walls being cut away, the pictures were included in frames; the statues from the roofs also were dispersed. Chalcothenes made unburnt models at Athens, in a place which was called Ceramicus, from his workshop. M. Varro says that he knew a man named Pofis, who made at Rome bunches of grapes and apples, which could not be discerned from real ones. He also extols Arcefilaus, the intimate friend of Lucius Lucullus, whose casts often fold for more than the other works of his art; by him was made a Venus Genitrix, in the forum of Cæsar; it was placed before it was finished, from the haste of the dedication. Afterwards by the same hand, a statue of Felicity was to have been set up, but both designs were frustrated by death. A cup was made for Octavius, a Roman knight, the model of which in plaster cost a talent. Pafiteles is praised, who says modelling is the mother of statuary, sculpture, and engraving. This art was very much used in Italy, and chiefly in Etruria. Turianus, being called from Fregillum by Tarquin the elder, made the statue of Jupiter, to be dedicated in the Capitol; it was a clay model, and, as usual, coloured red; his was also the model on the top of the temple of a chariot and four horses, which has often been spoken of. In this way he made a Hercules, which at this day in the city retains the name of its material. Pliny, l. xxxv. c. 43, 45.

The first of all who were famous for marble sculpture, were Dipœnus and Scyllis, born in the island of Crete. When it was under the dominion of the Medes, before Cyrus began to reign in Persia, that is, about the 50th Olympiad, they betook themselves to Sicyon, which was a long time the workshop for the metals of all countries. The images of certain gods they publicly placed at Sicyon, but before they had finished them, the artists, complaining of some injury, fled to Etolia. Forthwith famine and barrenness invaded Sicyon, and direful afflictions. A remedy being asked from Apollo Pythias, he immediately answered, "Let Dipœnus and Scyllis perfect the statues of the gods." They were intreated to do this with great rewards and liberal offers. These images were Apollo, Diana, Hercules, and Minerva, which afterwards were touched with lightning from heaven.

In their time there was, in the island of Chios, Malas, a sculptor; then his son Micciades; and then his grandson Anthermus, a Chian, whose sons, Bupalus and Anthernus, were famous in this science in the age of Hipponax, the poet, who, it is certain, lived in the 60th Olympiad. If this family had traced back their progenitors, they would have found art to have originated with the commencement of the Olympiads. Hipponax had a singularly ugly countenance; wherefore his likeness, produced in a vulgar joke, was held up to public ridicule; at which Hipponax, indignant, bore so hard upon them with the bitterness of his verses, as compelled them to hang themselves. But this is an error, for they made a great many statues afterwards in the islands. In Delos, where the song was composed, they could not escape the censure; but at Chios are the works of Anthernus, the son; and there is shewn at Jafius a Diana, made by their hands; and in Chios it is said there is a Diana of their work, whose face is much above the spectator's eye, and so contrived, that to those entering the temple she appears severe, but to those going out she appears exhilarating. At Rome their statues are on the Palatine Hill, on the top of Apollo's temple. In their country of Delos also are their works, and in the island of Lesbos. Dipœnus has certain works at Ambracia, Argos, and Cleone. All these artists used the white marble that comes

L

from

SCULPTURE.

from the island of Paros; which stone took the appellation of *lychnites*, because it was cut in the quarries by the light of the lamp, as Varro writes. Afterwards a much whiter kind was found; lately also in the quarries of *Lunensium*. But of the Parian a wonder is told: the stony glebe, divided by the wedge, fell apart, and an image of *Silenus* appeared within. It must not be omitted, that these arts, both of painting and statuary, so anciently produced, were taken up by *Phidias* in the 83d Olympiad, 332 years afterwards: for *Phidias* brought forward the art of sculpture in marble. His *Venus* at Rome, which is in the forum of *Octavia*, is a work of the most beautiful perfection. He taught *Alcámenes* the Athenian, who, it is certain, is distinguished among the first of the Athenians; whose works are at Athens, in many sacred temples. Famed above the rest is his *Venus* without the walls, which is called *Aphrodite* in the Garden. It is said that *Phidias* put the finishing hand to this statue. His disciple was *Agoracritus* of Paros, so agreeable to that age; therefore many works are given about in his name. There was a trial of skill between the master and the disciple, in making a *Venus*. *Alcámenes* conquered not by his work, but by the suffrages of his city, which favoured him against a stranger. Under the condition that it should not be at Athens, *Agoracritus* sold his statue. It is surnamed *Nemesis*. *M. Varro* preferred it to all statues. There are in the temple of *Magna Mater*, in the same city, works of *Agoracritus*. *Phidias* is undoubtedly famous through all nations, which have understood the fame of his Olympian *Jupiter*. That those may know how deservedly to praise his works, who have not seen them; we shall offer some arguments relating merely to his ingenuity; without comprehending the beauty of the Olympian *Jupiter*, and referring merely to the structure of the Athenian *Minerva*. It is 26 cubits, composed of ivory and gold: in her shield the Amazonian war is engraved; in the swelling part of the buckler, and in the concave part, the war of the gods and giants; in her sandals the *Lapithæ* and *Centaur*s, every minute particular put together with the greatest art. In the base is engraved the birth of *Pandora*. Here are gods produced, twenty in number: *Victory* is chiefly admirable. The skilful have admired the serpent, and; under the crest of her helmet, the *sphinx* of brass. These are transient observations: the art can never be sufficiently admired, whilst it is known that he was no less distinguished by such magnificence, than by the smallest things. We have spoken of *Praxiteles*, among the statuary of his age, as having excelled in the glories of marble, others, and also himself. His works are at Athens, in the *Ceramicus*. But before all, not only of *Praxiteles*, but on the whole globe of the earth, is *Venus*, which is viewed by multitudes who sail to *Gnidos*. He made and also sold two statues, one clothed, by means of which it was intended that there might be a preference. The *Coans* took one at the same price, considering that as the more severe and modest. That which was rejected was bought by the *Gnicians*. Immense the difference in their fame! Afterwards king *Nicomedes* would have purchased that of the *Gnicians*, promising to pay the whole debt of the city, which was immense. But they rather bore all, nor without cause, as long as the statue of *Praxiteles* ennobled *Gnidos*. Her little temple was wholly open, that the statue of the goddess might be viewed from all points; the goddess favouring them, as it was believed. No part was seen with less admiration than another. It is said, a certain person was enamoured with the statue, and hid himself in the temple all night. There are in *Gnidos* other statues of marble, by illustrious artists: *Bacchus*, by *Bryaxis*; and another, by *Scopas*; and a *Minerva*. Neither is

there any other specimen of the work of *Praxiteles* more excellent than the *Venus*, that should be recorded among these by itself. Of the same artist there is one a *Cupid*, objected by *Cicero* against *Verres*: it is that for which *Thespia* was visited. It is now in the *Octavian Gallery*. His is also another *Venus*, in a Parian colony of *Propontis*, like the *Venus* of *Gnidos* in nobleness and also in injury. At Rome are works of *Praxiteles*: *Flora*, *Triptolemus*, *Ceres* in the *Servilian gardens*, *Good Fortune*, and another statue of *Good Fortune* in the *Capitol*; also the *Mænades*, and those called *Thyades* and *Caryatides*; and *Silenus* in *Asinius Pollio's* monument, also *Apollo* and *Neptune*. *Cephalodorus* was the son of *Praxiteles*, and the heir of his art as well as of his estate; whose work of children embracing is at *Pergamos*, a very much admired and a noble performance of art: the fingers seem to impress the body rather than the marble. At Rome his works are, *Latona* in a chapel of the palace, *Venus* in *Asinius Pollio's* monument, and in the temple of *Juno*, which is in *Octavia's* portico, *Æsculapius*, and *Diana*. The fame of *Scopas* contends with his: he made *Venus*, and *Pothon*, and *Paethon*, which are worshipped in the sacred ceremonies of *Samothracia*; also the *Palatine Apollo*. The sitting *Vesta* is very much praised in the *Servilian gardens*; two *chamæteras* or companions around her sitting on the ground. Two like them are in *Asinius's* monument, where is a *canephorus*, or man bearing a basket, by the same artist. But the greatest honour in *Cn. Domitius's* temple, in the *Circus Flaminius*, belongs to his *Neptune* and *Thetis*, and also *Achilles*; *Nereides* sitting upon dolphins, sea-monsters, and *hippocampi*; also *tritons*, and a chorus of *phorci* and *pristes*, which are different kinds of sea-monsters, and many other marine subjects, all by his hand. This was a most famous performance, if it had been the whole work of his life. Now, besides what has been said above, we shall speak of things of which we are not certain. A *Mars* of his work, colossal, a sitting figure: it is in the temple of *Brutus Callaicus*, in the *Circus*. Besides a *Venus*, in the same place, surpassing the *Gnidian*, taking a preference to that of *Praxiteles*: it would have ennobled any other place. Rome, from its greatness, has caused that work to be forgotten; and the crowd of business and offices draw away from observation, because admiration of such things is fitted to great silence and more leisure. Equal doubt is in the temple of *Apollo Sosianus*, whether *Niobe* and her children were made by *Scopas* or *Praxiteles*. Also *Janus* the father, which *Augustus* brought from *Egypt*, and dedicated in his temple, but of whose hand it is fame does not tell us. Likewise in *Curia Octavia*, there is question concerning a *Cupid* holding the lightning; though at length it is affirmed to be the likeness of *Alcibiades* at that age. Many other things are in the same gallery, which please, whose authors are unknown: four *Satyrs*, with *Bacchus*, one of whom holds a flying garment over his shoulder; another similar *Bacchus*; a third quieting a crying infant; a fourth with a cup, satisfying the thirst of another with drink; two winds with flying vests. Nor is there less question who made *Olympus*, and *Pan*, and *Chiron*, with *Achilles*, in the *Septis*; particularly when their reputation has rendered them worthy of the pledge of their keepers' lives. *Scopas* had emulators in the same age, *Bryaxis*, *Timotheus*, and *Leochares*, who are always spoken of together, because they wrought together on the *Mausoleum*. This was the sepulchre of *Mausolus*, king of *Caria*, which his wife *Artemisia* made for him, who died in the second year of the 106th Olympiad. It is a work reckoned among the seven wonders of the world, which these great artists made. It is from south to north 63 feet, but shorter in front: its whole

SCULPTURE.

whole circuit is 411 feet, raised in height 25 cubits, surrounded with 36 columns. To the east it was sculptured by Scopas, to the north by Bryaxis, to the south by Timotheus, to the west by Leochares. But before the work was finished, queen Artemisia, to whose husband's memory, and by whose command, this work was built, herself died also. They did not, therefore, recede from the work, judging this monument necessary to the glory of their art. Adjoined to them was a fifth artist, who, above the pediment, added a pyramid on 24 steps, contracting like a cone toward the summit. On the top of all is a chariot and four horses, of marble, which was the work of Pythis. This being added, the height of the whole is 140 feet. The Diana in the palace at Rome is by the hand of Timotheus. In great admiration is a Hercules, by Menestratus; and a Hecate, in the Ephesian temple of Diana, behind the building; in the contemplation of which, the keeper of the building admonishes you to spare your eyes, such is the radiance of the marble. Not less estimable are the Graces, in the vestibule at Athens, which Socrates made. The painter is another person, as some think. But Myron, who is famous for works of brass, made a drunken old woman, which is celebrated in Smyrna. Pollio Asinius being a man of ardent courage, wished to exhibit it in the monuments he collected. Among these are centaurs carrying nymphs, by Archesitas; Thespiades, by Cleomenes; Ocean and Jupiter, by Entochus; Hippiades, by Stephanus; Hermerotes, by Tauriscus, not the celebrated carver, but one belonging to Trallianus; Jupiter Hospitalis, by Pamphilus, disciple of Praxiteles; Zethus and Amphion, and Dirce and the bull, the cords being of the same stone: it was brought from Rhodes, the work of Apollonius and Tauriscus, with their parent, who contended concerning the work. Menecrates was seen here; but Artemidorus was perfect nature. In the same place Bacchus, by Euty-chides, is much praised; Apollo in his own temple, on the portico of Octavia, by Philiscus the Rhodian; also Latona, and Diana, and the nine Muses, and another Apollo naked. He who holds the lyre, in the same temple, was made by Timarchus. Within the portico of Octavia, in the temple of Juno, the goddess herself, by Dionysius and Polycles; another Venus in the same place, by Philiscus; other statues by Praxiteles. Also Polycles and Dionysius, sons of Timarchides, made a Jupiter, which is in the adjoining temple; Pan and Olympus wrestling; and in the same place Heliodorus, which is another of the noblest groups in the world; Venus washing herself; Dædalus standing, by Polycharmus. The work of Lysias is held in great reverence, from the honour which it appears to have had: it is in the palace over the arch. Augustus Cæsar dedicated it to the honour of his father Octavius, in a little building adorned with columns; also a chariot and four horses running, and Apollo and Diana of one stone. In the Servilian gardens are found, very much praised, Apollo, by Calamis, the sculptor; Pytheas, by Dactylides; or, as other copies of Pliny have it, the pyctæ or pugiles by Dercylis; Callisthenes, the writer of history, by Amphistratus. Of many the fame is more obscure, because fame in great works is obstructed by the number of artificers; for each cannot occupy the glory which many equally partake; as in Laocoon, which is in the emperor Titus's palace, a work to be preferred before all both of painting and statuary. It is made from one stone, both Laocoon and his children, and the wonderful connection of the serpents, by the conjoined counsels of those greatest artists, Agefander, Apollodorus, and Athenodorus, the Rhodians. In the like manner, in the Palatine palace of Cæsar, abounding with approved statues of Craterus with

Pythodorus, Polydectes with Hermolaus, another Pythodorus with Artemon; a single statue, by Aphrodisius Trallianus alone. Diogenes, the Athenian, decorated the Pantheon of Agrippa; and the Caryatides, on the columns of the temple, are approved among a few of his works, such as being placed at the top of the temple, because of the altitude of their place, are less celebrated. Unhonoured is one, not in the temple, a Hercules, to which the Carthaginians a great many years offered in sacrifice human victims. It stands on the ground, before the entrance of the portico that leads to the statues of the Nations. There are standing the statues of the Thespiades before the temple of Felicity, of which one was loved by a Roman knight, Junius Pisciculus, as Varro relates; admired also by Pasi-teles, who wrote five volumes on the noble works in the whole world. He was born on the Italian Greek shore. Rich both in the city of Rome and its towns; he made a Jupiter of ivory, in Metellus's temple, which looks toward the fields. It befell him, that in a ship, in which were African wild beasts, standing at a den and carefully observing a lion, which he meant to carve, a panther broke loose from another den, not of slight peril to the diligent artist. He made many works, as it is said; but of those which he made, the names are not reported. Arcefilaus also is very much praised by Varro, who himself had a marble lioness, as he says, and winged cupids sporting with her; of whom some hold her bound, others force her to drink from horns, others kick her with their shoes: all of one stone. He made also, for Coponius, fourteen nations, which are in Pompey's Circus. I find Canachus (says Pliny) very much praised among statuaries for works he made of marble. Nor must Sauron and Batrachus be forgotten, who made the temple of Octavia, included in the portico. They were Lacedæmonians. They are said to have been very rich, and they built this temple at their own expence; very earnestly hoping to have an inscription, but it was denied them, notwithstanding they took another place and method to obtain it. There are, at this time, in the volutes of the columns, the signification of their names carved: a frog and a lizard. In Jupiter's temple is to be seen a picture, containing articles of dress, and all other things relating to women; for when the temple of Juno was completed, and they carried in the statue, they are reported to have changed the moveables; and that being guarded by religion, even as the seat partitioned among the gods themselves: in the temple of Juno is consecrated that which ought to be Jupiter's. Pliny, l. xxxvi. c. 4.

Such is Pliny's account of ancient sculpture.

It is well known, from the testimonies of later authors who have written on the subject, as well as from the names of Greek artists found on their works, that all the nobler productions of sculpture executed at Rome after the times we are speaking of, were the productions of Greek artists.

The busts of the twelve Cæsars, from Julius to Domitian inclusive, are the finest productions of portrait sculpture. The whole imperial series, both in busts and statues, down to the emperors Balbinus and Pupienus, possess the highest merit, and scarcely in that period shew the decline of art; but from the time of these emperors to that when Constantine fixed his capital at Byzantium, the decline was so evident, that the life and beauty of former times were nearly extinguished in their productions.

Before we quit ancient Rome, we must notice in a general observation some of the great works of art still remaining in that capital, which could not be properly introduced in the foregoing series.

The Trajan column is one of the most beautiful monuments of ancient Rome, and the most superb column in

SCULPTURE.

the world. It was raised about the commencement of the second century, by the senate and people of Rome; in honour of the emperor Trajan, after the victory that he had obtained over the Dacians. This column is admirable for its height; and more still for the beauty of the bas reliefs with which it is ornamented; which represent the first and the second expeditions, and the victory obtained over king Decebalus. These bas reliefs are correctly designed, and most beautifully executed. There are numbered more than 2500 figures, all in different attitudes, without counting those of horses, elephants, arms, machines of war, and an infinity of others; altogether forming a variety of objects, which no one can see without admiration. Upon the capital of this column is a pedestal, on which was anciently a colossal statue of Trajan in gilt bronze. In the place of this statue, pope Sixtus V. caused to be placed, in the year 1588, that of St. Peter the apostle in bronze, which was modelled by Thomao Porta. The same pope caused also to be cleared away the earth which encumbered the pedestal.

At the bottom of the pedestal, or base of the column, in one of the sides is a door, by which we mount to the top of the column. The stair-case contains 185 steps, cut in the same blocks as the column: and to them are made 44 windows, which light the stair-case; and there is on the top a balustrade, by which we may walk around and enjoy the prospect of the whole city of Rome. The height of this column is 118 feet, comprising the pedestal of the column and the statue on the top. The column alone, with its base and capital, is 92 feet; the pedestal of the column is 17, that of the statue 9; the lower diameter of the column is 11 feet 3 inches, the diameter of the upper part is 10 feet. This column is formed of 22 blocks of white marble, fixed with lead one upon another. The shaft of the pillar is in 23 pieces; the pedestal in 8; the capital 1; and the pedestal of the statue another.

The magnificence of this column answers to that of the ancient forum of Trajan, of which it occupied the centre. The Forum or Square of Trajan was surrounded by grand porticoes, and the edifices were built with the greatest magnificence after designs by the celebrated Apollodorus. These consisted of a temple or palace, where the consuls sat in judgment; the temple of Trajan, where was the Ulpian library, ornamented with statues of the learned; a superb triumphal arch with four equal faces, that the senate caused to be built to the honour of the prince after his death; and a beautiful equestrian statue of Trajan, in gilt bronze: the statues, the cornices, the architraves, and the friezes which ornamented these edifices, were also in bronze. It would be difficult to describe all the magnificence of this superb square. Trajan caused a valley to be filled up, and levelled one part of Mount Quirinal, to make a level for this beautiful situation.

The Antonine column has given its name to the place of which it is the principal ornament. It was raised by the Roman senate, and by the emperor Marcus Aurelius Antoninus, in honour of Antoninus Pius, his father-in-law, whom he succeeded in the empire. His ashes were enclosed in a golden urn, and placed on the top, with his statue in bronze gilt; and because he had not obtained any one great victory in war, they caused to be sculptured around the column the victory over the Marcomanni. Time and various revolutions, and above all the fires, which had been anciently very frequent in Rome, have much damaged this column. Pope Sixtus V. caused it to be repaired in the year 1589, and the statue of the apostle Paul, in bronze gilt, to be placed upon its summit. This column is of

white marble, surrounded by bas reliefs from the base to the capital. The artist appears to have taken for his model the Trajan column; it is of the same style, though of inferior execution. The whole is composed of 28 blocks of marble: it is 15 feet in diameter, and 116 in height, without including the statue, which is 13; and the pedestal, on which it is placed, which is 9. The column contains a beautiful winding stair-case of 190 steps, which conduct commodiously to the top; it is lighted by 41 windows.

The arch of Titus was raised by the senate and people of Rome to the honour of Titus Vespasian, for his conquest of Judea and the taking of Jerusalem. It is of the most excellent workmanship, but has very much suffered from the injuries of time. It is ornamented with beautiful bas reliefs, and two fluted columns of the Composite order. Under the arch is seen the triumph of the emperor, drawn in a chariot by four horses, accompanied by his liftors; and in the triumph the famous candlestick of seven branches, the tables of the law, and other spoils of the temple of Jerusalem.

The arch of Septimius Severus was raised by the senate and people of Rome, at the beginning of the third century, to the honour of that emperor, for having subjugated the Parthians and other barbarous nations. It is all of white marble, with three arches and eight fluted columns of the Composite order, ornamented with bas reliefs, of middling sculpture. It has suffered very much, and because it is partly buried in the earth, we cannot so well judge of its beauty; formerly there was an ascent to the top of the arch, by a stair-case in the interior; and there was placed upon its roof the emperor Severus in a triumphal chariot drawn by six horses.

After the famous victory obtained over Maxentius by Constantine the Great, the senate and people of Rome caused a triumphal arch to be raised to his honour: it is of the Corinthian order, having three arches; the two grand fronts are ornamented by eight fluted columns of yellow marble, and many bas reliefs of very different merit. Those that were made in the time of Constantine make us perceive the barbarity into which the fine arts were beginning to fall; the others, on the contrary, which were taken away from the arch of Trajan, present such beauties, as indicate an age when sculpture was in high perfection. These are twenty in number, of which ten are of a square form, and are in the upper part; eight are round, above the side arches, and two others more large under the grand arch. All these bas reliefs, and the eight figures of Dacians placed upon the columns, prove themselves to belong to the expeditions and victories of Trajan.

The arch of Marcus Aurelius formerly stood in the Flaminian way, now called the Corso, or principal street in Rome; it was taken down by Alexander VII.; two fine remaining bas reliefs from which are at present in the Capitol; one of these is an apotheosis of the empress Faustina, the other is an address of the emperor to the people of Rome. The figures are larger than life.

In general observations on the sculpture of the arches and columns here enumerated, we shall remark, that the earliest of them, the arch of Titus, must have been executed about the year 70 of the Christian era, consequently when sculpture had lost much of its primitive ideal beauty; we shall of course find in these works less of sublimity and more of coarseness in the forms, consisting of subjects which were confined to battles, ostentations, triumphs, and acts immediately confined to them. The Roman generals and soldiery, as well as the barbarians whom they fought with and conquered, are represented with an individual vulgarity of face and person, very different from the choice selection of beauty in the works of Greece. The dress and
armour

SCULPTURE.

armour are more complicated and divided than those of the ancient Greeks, added to the inferiority and confusion of parts, still augmented by the introduction of ships, bridges, piles of wood, battering rams, catapults and other military engines, &c., wholly omitted in the works of the best ages. The contests are of the coarsest means, and of the most brutal force, unalleviated by any interference of supreme beings, and unexalted by the beauty of the ancients. With such a character in the whole, the sculpture on the arch of Trajan, now the arch of Constantine, is superior to the rest of these works. Upon the whole, although the bas relief of the apotheosis of Faustina, formerly on the arch of Marcus Aurelius, is a more sublime conception, the sculpture of the Trajan column has a great variety of natural attitudes, according to the situations in which the persons are placed, and the relieve has that general breadth, which is best suited to shew the outline of the column in all views. The figures and groups on the Antonine column are carved with a bolder relief; but such as deforms the shaft of the column by its irregular hollows, producing something of the appearance of rock-work to the whole outline. The sculpture on the arch of Severus is still more deteriorated in its style and conduct; and such of the bas reliefs on the arch of Constantine as were executed in the reign of that prince, have such a Gothicism and barbarity of execution, as would utterly exclude it from that class of sculpture, which has moderate pretensions to science, or any pretension whatever to sentiment.

We must not omit to mention some colossal statues, still existing entire or in parts in the city of Rome: 1st, two colossal statues of marble on Monte Cavallo, standing before the pope's palace, each nineteen feet and a half high. The figures are in the prime of youthful manly beauty; the faces are of the highest class of Grecian beauty; the figures seem to breathe and move; their position is advancing; with one hand each holds his charger. They have been called Castor and Pollux, Achilles and Patroclus, Alexander and Hephestion, also Achilles, at the moment when his horse declares the will of Jupiter; on the authority of two coins of Nero and Adrian struck at Corinth, bearing on the reverse a hero holding a horse, much resembling this group; it has been called Bellerophon holding Pegasus. One of these statues, bears the name of Phidias on its pedestal, the other statue seems to be this original, reversed by some other artist, to stand as its companion in some conspicuous situation.

In the cortile of the Capitol are remains in marble of the colossal statue of Domitian, which appears to have been, when entire, about forty feet high; the head and neck to the bottom of the gullet is of one stone, and about eight feet high; the feet are each six feet long; the knees, elbows, and some other fragments, are remaining. It appears to have been nearly naked, to have stood erect, to have had a chlamys hanging on the left arm; and is perhaps the same colossal of Domitian as that described by Philo Byzantius, according to his testimonies from different Latin authors.

There is, in the same cortile, a head in bronze, believed to be that of the emperor Commodus, which from other remaining fragments was a colossal statue also.

The equestrian statue of Marcus Aurelius, considerably above the size of nature, in the centre of the Capitol, of noble workmanship, is sufficiently known to lovers of art by the prints of Perrier and other artists.

When Constantine removed the seat of empire from Rome to Byzantium, he and his successors are said to have taken from the ancient capital of the world, as many of the fine works of art as they could possibly remove. The Greek

artists were employed in their own country to decorate the new capital, with the same magnificence indeed as in former times, and like their predecessors were employed in the cause of religion, not in emulation of Phidias's Jupiter or Praxiteles's Venus, but in the cause of that sacred person who disclosed, and of his followers who propagated the new dispensation of mercy. The architects were employed in building Sancta Sophia and other great sacred buildings in the city; and the painters and sculptors in the illustration of the Old and New Testament.

The controversies of religion and philosophy had been agitated with so much violence by the philosophers of Alexandria against the Christian divines, as induced the successors of Constantine to abolish the schools both of Athens and Alexandria; they also issued orders for the removal and destruction of the Pagan idols; and in the fourth and fifth centuries it is believed that the Olympian Jupiter at Elis by Phidias, and the Venus at Gnidos by Praxiteles, with others of the most distinguished works of Pagan sculpture, were destroyed, either by imperial orders or the ravages of barbarians. The Iconoclasts, and the irruptions of the followers of Mahomet and other barbarous people, very nearly destroyed all the remains of the finest Greek sculpture in the East as well as in western Europe. This destructive fury against the arts and artists, continued with interruptions for two hundred years; still, however, the Christian Greek compositions from the Old and New Testament, from the time of Constantine down to the thirteenth century, were followed as examples of character and composition by the revivers of art in western Europe, down to the times of Michael Angelo and Raphael.

After the sacking of Constantinople by the Venetians, the only efforts of that feeble state were a few faint struggles for existence, previous to its destruction by the Mahometans.

To give some idea of the magnificent sculpture which adorned Constantinople, we shall insert the description given by Coniatus, of those fine works which decorated this city, before it was taken by the Venetians.

The Roman conquerors, who were of an avaricious temper even to a proverb, practised a new method of rapine and plunder, unknown to those who had taken the city before them: for breaking open by night the royal sepulchres in the great grove of Heroum, they sacrilegiously rifled the corpses of those blessed disciples of Jesus Christ, and carried off whatever was valuable in gold, rings, and jewels, which they found in these repositories of the dead. They spared neither the house of God nor his ministers, but stripped the great church of Sancta Sophia of all its fine ornaments and hangings, made of the richest brocades of inestimable value; but they no sooner cast their eyes on the brazen statues than they ordered them to be melted down. The fine statue of Juno in brass, which stood in the forum of Constantine, they chopped to pieces and threw into the forge. The head of this statue was so large, that four yoke of oxen could scarcely drag it. On the base of it was cut, in basso relievo, the figure of Paris presenting Venus with the apple of discord. The noble quadrilateral pillar, supported by several ranges of pillars, and which by its height overlooked the whole city, and was both the wonder and delight of the curious spectator, shared the same fate. This lofty column was adorned with rural representations of all kinds of birds, flocks of cattle, and of sheep bleating and lambs frisking and playing, &c. There was also engraved upon it a view of the sea and sea-gods, some of whom were catching fish with their hands, others ordering their nets, then diving to the bottom, while some in a

SCULPTURE.

wanton manner were throwing balls to one another! This pillar supported a pyramid on the top of it, on which was placed the statue of a woman, which turned about with the wind, and was therefore called *Anemodé*. This excellent piece was also melted down for coinage, as was also an equestrian statue, fixed upon a quadrilateral pedestal in the *Tauris*. This was a bold figure, of an heroic countenance, and surprising stature. He was said by some to be one of the spies who were sent by Joshua, the son of Nun. With one hand he pointed eastward, with the other to the west. But this statue was generally reported to be *Bellerophon* sitting upon *Pegasus*; for the horse was without a bridle, as *Pegasus* is mostly figured, scouring the plain, despising a rider, flying and driving about in a headstrong manner. This horse and his rider were also melted down; the barbarous soldiers expressing their utmost fury against the finest statues and most curious pieces of workmanship in the *Hippocum*. The great statue of the *Hesperian Hercules*, which was fixed upon a magnificent pedestal, and clothed in a lion's skin, which seemed to live and affright the spectators with his tremendous voice, felt the effects of military power. He was not armed with his quiver, his bow or his club; but stretching out his right leg and arm, he kneeled upon his left knee, and leaning upon his left elbow with his hand open, supported his head in a thoughtful manner, seeming to lament his misfortunes. This figure was broad-chested, the shoulders were large, the hair long, curled, and reaching to the waist; the arms were brawny, and as long as those made by *Lyfimachus*, which was the original of this, and was the first and last masterpiece of his skill. In short, of such a stupendous size was this statue, that his wrist was as thick as a man's body, and his leg equal in height to any ordinary person. This noble statue did not escape the rage of these mighty pretenders to virtue and honour. Besides this they also carried away the image of the ass and his driver, which figures were set up originally by *Augustus Cæsar* at *Actium*, of whom the story reports, that when he went out privately in the night time, to take a view of *Anthony's* camp, he met a man driving an ass, and asking him who he was and where he was going? the man answered, "my name is *Nicon* and my ass's name *Nicander*, and I am going to *Cæsar's* army." The statues of the hyæna, and of the wolf which suckled *Romulus* and *Remus*, underwent the same fate, and were coined into little brazen staters. The several statues also; of a man fighting with a lion; of the horse *Neïlous* covered with scales behind; of an elephant with a moving proboscis; of the sphynxes, beautiful as women and terrible as beasts, which can occasionally walk or fly in the air; there was also the statue of a wild horse, pricking up his ears, curvetting and prancing:—this and old *Sylla* were ferved in the same manner. She was figured like a woman to the waist, with a grim frightful look, just as she appeared when she sent her dogs to destroy *Ulysses*. There was also placed in the *Hippocum* a brazen eagle, which was the invention of *Apollonius Tyanens*, and a celebrated monument of his forcery. This impostor being requested by the Byzantines to heal them of the bitings of serpents, which were then common among them, using charms and diabolical ceremonies placed this eagle upon a pillar. It was a pleasant sight enough, and deserved to be more narrowly inspected, for it made an agreeable harmony, and less dangerous than the Syrens. Its wings were stretched out as ready for flight, and it was trampling upon a serpent, which wreathed itself about the eagle. The serpent seemed to make the utmost effort to bite the eagle; the eagle looked brisk and lively, and seemed to have obtained the victory, and to be ready to bear him through the air in triumph, de-

noting that the serpents that tormented the Byzantines would hurt them no more, but suffer themselves to be handled and stroked by them. But these were not the only curiosities to be observed in this aquiline statue; for the twelve hours were engraven under his wings, under each wing six, which shewed the hour of the day, by the sun darting through a hole in each wing made for that purpose. There was also a fine statue of *Helen*, whose charms laid *Troy* in ruins; her fine proportions, in breathing brass, captivated all beholders; her habit sat loose upon her, which discovered too great an inclination to gallantry; her long and delicate hair seemed to wave in the wind; it was braided with gold and jewels; her robe was girt about her and falling down to the knee; her lips seemed like opening roses, you would fancy they moved; and such an agreeable smile brightened her countenance, as entertained the spectator's eye with pleasure. There was also placed upon a pillar a more modern statue of a woman. Her hair hung down behind, combed close down from the forehead backwards, not braided up but bending, as if to the hand of the spectator. Upon the right hand of this statue stood the equestrian statue of a man; the horse stood upon one leg, the other bore a cup with liquor. The rider was of a large size; his body completely armed; his legs and feet covered with greaves; his air was manly, rough, and warlike. His horse was mettlesome and high couraged, pricking up his ears as if he heard the trumpet; his neck was high, his look fierce, as eager for the battle, rearing up his fore-feet and prancing as a war horse. Near this statue, hard by the eastern goal called *Rufius*, were a range of statues of charioteers, dextrous in driving the chariot and turning the goal. They were very busy in managing their bridles and smacking their whips, and directing their horses, with their eyes fixed steadily upon the goal. There seemed to be described in these figures all the tumult and fury of a chariot race, with the most vigorous struggle for victory. But what excited the greatest admiration was a large pedestal, having on it an animal cast in brass as large as an ox, with a short tail and a moderate dew lap, something like the Egyptian cattle; it had no hoofs; it held in its teeth, ready to strangle, another animal, clothed all over with scales that seemed impenetrable. This appeared to be a basilisk; it had a mouth somewhat like a serpent's. These figures seemed to represent an odd kind of fight, each of them furiously striving for victory. The creature which seemed to be the basilisk was in colour like a frog, and was all over bloated from head to foot; he was casting out his venom upon his antagonist, to destroy him, while he was represented as bearing upon one knee and in a languishing state. There was also a figure of another animal, in whose jaws was represented a smaller creature whose mouth was open, as almost choked by the teeth, which held him, struggling to get loose but to no purpose. His tail, which was very short, seemed to tremble; his shoulders, his fore-feet, and a part of his body, were hid in the mouth of his enemy and mashed by his jaws. This is the case with nations and kingdoms, which thus mutually destroy one another.

For further satisfaction concerning the state of sculpture in the fourth and fifth centuries, a short description of the column of *Theodosius*, erected at *Constantinople*, will be added.

This column was, in its general shape and size, an imitation of that of *Trajan* in *Rome*; although, by the description of such travellers as saw it standing, it appears to have been larger, and formed of the same material, statuary marble, decorated like that column, with a spiral bas relief, from the bottom to the top of the shaft, surmounted by a statue of the emperor. The pedestal was covered with military

SCULPTURE.

litary bas reliefs, on one side of which was the emperor, sitting, crowned by two victories, with a glory, including the cross. The shaft of the column was drawn by Gentile Bellini; the subjects are, the triumphal entry of Theodosius, Arcadius, and Honorius, as it is believed, with the captive Goths and Lesser Tartars; their idols, kings, generals, waggons, horses, dromedaries, elephants, and oxen; the captive multitude, with emblematical figures, representing the city of Constantinople: and the various figures of the virtues, complimentary to the emperors, particularly relating to their valour and clemency. Whoever desires to be more particularly informed of the remains of ancient sculpture which decorated Constantinople, may consult Gyllius and Du Fresne, and the Byzantine writers.

Of Modern Sculpture.—From the fourth century the art continued to decline, by the inroads, first of the Goths and Vandals, and afterwards of the Saracens: and this decline is manifest in fragments and ruins of the ages as they succeed each other.

Theodoric, king of the Goths, established the seat of his kingdom at Ravenna; his reign was long, and as he very much loved building, he applied himself in his capital, and at Rome, and in the principal places of Romania and Lombardy, to build several palaces and churches, which are yet to be seen, all of them of a rude character, remote from the principles of architecture, and the exact rules of the ancients; he caused palaces to be built at Ravenna, Pavia, and Modena, after a barbarous way; which were rather great and rich than of good architecture. The same may be said of the church of St. Stephen at Rimini, of St. Martin at Ravenna, and of the temple of St. John, built in the same city in the year 438, by Gallia Placidia.

The capitals of columns in buildings erected by Theodoric and his family, are gross copies from the ancient Doric and Ionic, in which no attention is paid to the outline: the leaves and volutes are without relief; the whole masses are coarse, and without effect: the sculpture of basso rilievo on the sarcophagus of this king and his family at Rimini, which represents our Saviour and his Apostles, is without design, and of the rudest workmanship.

The church of St. Vitalis was built at Ravenna in 547. Queen Theodolinda caused the church of St. John the Baptist to be built at Monza, where was painted the history of the Lombards; her daughter, queen Gundiperga, caused a church to be built at Pavia. They are all of the ancient Gothic.

By the ancient Gothic is here meant a gross imitation of the Roman buildings and Roman sculpture, without harmony, proportion of parts, or design, as nearly as these unpractised barbarians could imitate from the ruins of Roman buildings, without any science, and with clumsy instruments.

If the Gothic kings who embraced the Christian religion had their painters, sculptors, and architects, they had also, to counteract these, cruel wars to support against the barbarians, who still remained averse to art and science; all Europe was involved in such confusion, that little satisfaction can be derived from the histories, and still less from the few barbarous remaining works.

In the year 496, Clovis, king of the Franks, was converted to Christianity; he built the church of St. Peter and St. Paul at Paris, which is now called St. Genevieve. The same rude workmanship is in the church of St. Germain, built by Chilbert, son of this king. Although these two venerable remains of antiquity have been destroyed in the French revolution, yet specimens of the sculpture are preserved among the French monuments at the church of the

Little Augustins; some of which, said to be of this age, appear to be much later, as the statues of the kings in the portico of St. Germain de Prez, which appear rather to have been done in the eleventh century. The capitals in this collection of the age of Charlemagne, brought from St. Denis, exhibit sculpture, if sculpture it may be called, in its lowest state of abatement; it is wanting in every principle of art, both of design and execution, and it is not without attention that you can discover that its efforts were intended for the representation of human figures.

What we have said of the state of sculpture in France will answer equally well for every thing that was done in England, Italy, Germany, and throughout the continent, at this time.

In the year 805, Charlemagne built the church of the Apostles in Florence, which has always been esteemed by architects of singular beauty, so that Brunelleschi took it as a model so long afterwards as the year 1400.

In the eleventh century, when the terrors of the Norman invasions, in addition to those of former barbarians, had passed away, the governments began to be more regular and established; agriculture and commerce began to revive; and the crusades had diffused a ray of light among the northern nations, derived from the arts and literature of the East, so that then the arts of design began that regular course of improvement which has been denominated their revival.

In 1016, the Pisans founded their great church, called the Dome of Pisa. The commerce they had by sea, and particularly into Greece, was a favourable means for the re-establishment of architecture and sculpture. They brought from thence several columns and fragments of ancient architecture, of marble, which they made use of in this church.

They brought together by these means several Grecian sculptors into Italy, and also Grecian painters, who worked after their own old methods, for using in their painting only simple lines, which they coloured all over equally, without any shadowing: their works were not very artificial, notwithstanding these remainders of art taught the Italians the practice of painting in water colours, or fresco and mosaic.

But among all the artists of that time was Buschetto, a Grecian of Dulichium. The cathedral of Pisa was built under his direction; for besides the magnificence and fine plan exhibited in this church, he used with great dexterity those ancient pieces of Grecian architecture, to compound together with his: these were fragments brought from Greece.

This great building excited in all Italy, and particularly in Tuscany, those who had any genius for designing.

Thus the arts of designing began to be revived in Tuscany before they were known in other countries; and very great fabrics were reared in several cities of Italy. At Ravenna, in the year 1152, Il Buono, a sculptor and architect, built a great many palaces and churches: he also founded at Naples the castle of Capuano, now called the Vicarage, and Castel Delluovo; also at Venice he built the steeple of St. Mark.

In the year 1063, the spoils which the Pisans brought from Sicily enabled them to add to the magnificence of their cathedral. The capitals and fragments of pillars they had brought from Greece and Sicily, were employed in the cathedral church and in the Bell tower; in which latter building every capital almost is of fine ancient Greek workmanship. The sarcophagi, still preserved in the Campo Santa, formed the school in which Nicolo Pisano and his successor improved their sculpture. The consequences of these improvements are seen in the works of Nicolo Pisano, which are the pulpit of Sienna, the pulpit of the baptistry of Pisa, the bas relief

SCULPTURE.

of St. Martin's at Lucca, the bas relief in the cathedral at Orvieto, and in other parts of Italy, in which his constant attention to the ancient bas reliefs is every where observable. At this time the crusades had diffused such a spirit of piety, that magnificent churches were built all over Italy, in the designing of which, as well as the decoration with sculpture, Nicolo Pisano and his scholars were universally employed.

On the basement in the west front of the cathedral of Orvieto, there is a series of basso relievos, the work of Nicolo Pisano and his school, containing the most important subjects of the Old and New Testament, from the Creation to the Last Judgment, with separate figures of the prophets. The different subjects are contained in a running foliage, making the most rich and beautiful decoration to the four basements formed by the three doors in that part of the church. The figures are each about twenty-two inches high, very highly finished in statuary marble. There is in many of them a beautiful simplicity of sentiment, and in those of the Last Judgment, and the other bas reliefs that immediately relate to it, there are various striking instances of passion and terror. The pulpits also in the cathedral of Sienna, and in the baptistery of Pisa, which were before mentioned, are magnificent architectural designs, richly adorned with scriptural basso relievos by this artist.

At Pisa, in 1174, William Oltramontano and Bonnano, a sculptor, founded the steeple of the dome. The royal gate of brass in this church was made by Bonnano.

John Cimabue was born at Florence in the year 1211; he very much improved the art of designing; his disciple Giotto was both a painter and sculptor. Cimabue learned his art of Greek painters, who were employed in Florence. At the same time with Cimabue, flourished Andrea Taffi, a Florentine painter in mosaic; he went to Venice to perfect himself in his art; having learned that there were Grecian painters who worked in that way in Venice, he engaged Apollonius, one of them, to come and work with him in Florence, where they made several pieces. Taffi learned of this Grecian the art of making enamels and plaisters that would last a long time: he died in the year 1294.

About the year 1216 appeared Marchione, architect and sculptor of Arezzo, who worked much at Rome for the popes Innocent III. and Honorius III.: he made the fine chapel of marble at St. Mary Maggiore, with the sepulchre of that pope, which is of the best sculpture of those times. But one of the first architects who began to reform in Italy, was a German named James, who built of stone the great convent of St. Francis; he dwelt at Florence, where he made the chief fabrics; he had a son, named Jacopo Amolfo Lapo, who learned architecture of his father, and designing of Cimabue. He founded the church of St. Cross, at Florence, and several other buildings, the most considerable of which is the magnificent church of St. Mary del Fiore.

John Pisano was the son of Nicholas, and was also a sculptor and architect. In 1283 he was at Naples, and built there, for king Charles, the new castle, and several churches, and being returned into Tuscany, he made several pieces of sculpture at Arezzo, and also of architecture in that province, and died in the year 1320.

John Pisano deviated from his father's rigid imitation of antiquity, in giving a more waving line to his figures, and broader and less determined folds to his draperies, like the paintings and designs of Giotto. There is a general grace and delicacy in the character of his figures; of which the bronze statues of a madonna and angels in the cathedrals of Orvieto and Florence are examples; and there is so strong a resemblance between the styles of these statues and those

of queen Eleanor at Northampton, Geddington, and Waltham, on her crosses; as affords reason to believe they were produced by one of the ablest of John Pisano's scholars, if not from some statue or model by himself: nor is it here that the resemblance ceases, for this style is to be traced in most of the sculptures of Europe from this time to the reign of Henry VII. This sculptor had for pupils, Agostino and Agnolo Sanesi; they were, in the opinion of Giotto, the best sculptors of the time, which procured them the chief business of Tuscany. They worked also at Bologna and Mantua, and bred up several ingenious pupils, and particularly carvers in silver, as Paul Aretino, a goldsmith, Maestro Cione, and Jacomo Lanfranco, a Venetian, and Peter Paul, of the same city.

Giotto made designs for the brazen doors in the baptistery of Florence, which were engraven by Andrew Pisano, who also made several figures of marble in the church of St. Mary del Fiore. Andrew was as famous for sculpture as Giotto was for painting. The bas reliefs on the doors of the baptistery represent the life of St. John the Baptist, and possess great simplicity and grandeur for the age in which they were produced.

Stephen Florentin, Taddeo Gaddi, and Peter Cavallini, were scholars of Giotto, and in 1350 they formed at Florence an academy of designing, which was the first that had been formed since the revival of the arts. Taddeo Gaddi began to collect ancient sculpture for his studies, and there is a fine Greek body of a faun which belonged to him, which is kept in the ducal gallery, and is known by the name of Gaddi's Torso.

This ingenious society was afterwards encouraged and assisted by the princes of Medicis, which perfected at Florence the establishment of the arts of design, for there came out of that school a great number of painters, sculptors, and architects, who embellished that famous city, and all Italy, like another Sicyon, where, in the time of the first ancients, the first academy of design had been established; this quickly shewed at Florence those great geniuses Lorenzo Ghiberti, Donatello, and Brunelleschi, and many other ingenious contemporaries.

Bartoluccio Cione was a sculptor in bronze, gold, and silver, and father of Lorenzo Ghiberti, who, besides following his father's profession, added to it the study of painting and architecture. He made the two fine brazen gates in the baptistery of St. John, one of which represents the history of the Old Testament, which Michael Angelo said was worthy to be a gate of Paradise; the other gate is adorned with the principal acts of our Saviour's life. Besides the beauty of the historical subjects in the pannels, the architraves and friezes of those gates are of exquisite design, containing flowers, fruits, plants, and animals, so perfect that they seem to have been cast from nature. He executed a figure of St. Matthew, in bronze, of a colossal size, in the church of San Michele, but this figure is inferior to his smaller works, from an attempt at excessive grace; the folds of drapery also are too minute, curvilinear, and not well accounted for. He executed some basso relievos in bronze, of the life of St. John the Baptist, on the baptismal font in the cathedral of Sienna; he also executed some painting in the same church when he was young. Ghiberti made also several curious shrines, and a triple crown for pope Eugenius; it was of gold and jewels, valued at thirty thousand ducats of gold. Afterwards he became supreme magistrate of Florence, but still practised architecture, managing for some time the building of the church of St. Mary del Fiore.

Donatello very much excelled the sculptors who had gone before him, in his copious compositions, and the passion and

and life of his designs, and in the character of nature in his statues, which are to be seen in Florence; he was born in 1403, and lived to be above 80 years old. His statue of St. George is a youthful pedestrian figure, standing with his legs considerably apart, his two hands before him leaning on his shield. Michael Angelo admired the head of this figure so much, that he copied it in the monumental statue of Julian, duke of Nemours. Donatello designed some fine bas-reliefs from the life of St. Anthony of Padua, which were executed by one of his pupils, and decorate the principal altar of the cathedral of Padua. He composed and executed the greater part of those noble bas-reliefs from the life of our Saviour, in bronze, round the two pulpits of St. Lorenzo, in Florence; the sentiment, passion, and composition of which, in parts, it seems impossible to excel. He executed different statues of St. John, and crucifixes in wood, the characters of which are rather vulgar, and consequently very inferior to his bas-reliefs. It was said of this artist, upon the Pythagorean idea of transmigration, that either Michael Angelo's soul energized in his body, or his in Michael Angelo's. There is a bronze figure in the market of Florence, of Judith with the head of Holofernes, which, though by his hand, has nothing striking in the attitude; and its drapery is confused. But there is another statue of a youth naked, about twelve or fourteen years old, in the ducal gallery, which is worthy to be ranked with the fine statues of antiquity.

Bruneleschi, the friend of Donatello, was an excellent sculptor, goldsmith, and architect, and revived the true and ancient way by his indefatigable care. The remains of his sculpture are very few; there is an admirable crucifix, carved in wood by him, in the church of St. Mary Novella at Florence.

About the year 1450 appeared Andrea Verrochio and Dominic Ghirlandaio, sculptors and painters in Florence. Verrochio was an excellent sculptor and engraver, not only in brass, but also in marble; he was also a good architect. He was esteemed of the first rank of sculptors, and preferred to Donatello and to Ghiberti, in making St. Thomas feeling our Saviour's side, which he constructed of brass for the oratory of St. Michael. He was the master of Pietro Perugino and Lionardo da Vinci, and other excellent pupils. His last work was the famous figure on horseback of Bartholomeo Cogleone da Bergamo, which is at Venice, in the square of St. John and St. Paul.

Dominic Ghirlandaio was the master of Michael Angelo; he worked more in painting than in sculpture, particularly in mosaic for pope Sixtus IV. in the Vatican. He was particularly qualified as an instructor to that great man, from the delicacy of his genius as well as his original and copious invention.

But the progress of art was greatly accelerated by the progressive discovery of those miraculous productions of ancient Greek art, which had been buried so many ages, and were by degrees restored from the bowels of the earth. Poggius, the secretary to Eugenius IV., in the year 1430, particularly enumerated all the remains of ancient magnificence in Rome existing at that time, among which he reckons only five statues; two of them were the colossal statues by Phidias and Praxiteles, on mount Cavallo; the third the equestrian statue of Marcus Aurelius, at that time before the church of St. John de Lateran; the two others, perhaps, were the figure called Marforio, which is a recumbent statue of the Ocean, now in the Capitol; the other a fragment of the group of Ajax supporting the body of Patroclus, called Paquin. The Laocoon was found in the year 1506.

In the year 1474 was born at Florence Michael Angelo Buonarrotti; he was brought up to learning, but busying himself always in private about designing, which his father observing, put him to Dominic Ghirlandaio. In a little time Michael Angelo distinguished himself above his other disciples by the surprising facility with which he designed. This great genius was very fortunately favoured by prince Lorenzo de Medicis, who, with great love to art, and desire to assist men skilled and learned therein, established in the gallery of his gardens an academy, which he filled with fine pictures and pieces of sculpture, both ancient and modern, and fought out at Florence those young designers who promised most, to whom he allowed pensions to promote their studies. Those of the school of Ghirlandaio were chosen the first, and particularly Michael Angelo, who, having one day taken up a piece of marble, set about making a head, though he had never before handled a chisel, which so much surprised prince Lorenzo, and he conceived so great an affection for Michael Angelo, that besides allowing him the pension, he made him a companion at his table, and gave him a lodging at his palace. After the death of this prince, his successor, Pietro de Medicis, continued Michael Angelo the same affection he had enjoyed from his father.

At Rome he made a marble statue of Bacchus, with several other marble statues. At his return to Florence, he applied himself with the same diligence, and made a David of marble, which was set up before the palace. Peter Soderini, the Gonfaloniere, and the citizens in general, were so charmed with the statue, that they required of him other works in bronze and in painting. The Gonfaloniere then ordered him to paint one half of the council-hall, and Lionardo da Vinci the other.

Michael Angelo in this work gave proofs of the excellence of his designing, both with respect to the composition of the subject, which was the war of Pisa, and in the correctness of his naked figures; and to have an opportunity to shew it the better, he chose the time when the soldiers were bathing in the river Arno, to introduce the figures naked. Raphael, and the artists his contemporaries, improved the grandeur of their design from that cartoon.

Julius II. being raised to the papal chair, sent for Michael Angelo to Rome, resolving to engage him in a mausoleum in St. Peter's, which was intended to stand under the centre of the dome, to be the most magnificent of the kind ever raised, and the principal object in the church. This work, however, was delayed till the pope died, and then one of its faces only, and upon an inferior scale, was erected by his nephew in the church of St. Peter in Vincole. The figures which decorate the architecture of this tomb are those of the pope, Moses, and allegorical virtues. Two statues of marble, which were to be part of this sepulchre, are now in the castle of Richelieu in France.

The execution of this monument was interrupted by Michael Angelo being at the same time employed by the pope to paint in fresco the arched ceiling of the chapel of Sixtus IV., which so much raised his reputation, that besides the general applause that he received at Rome, the pope rewarded him also with several presents. Julius II. being dead, Leo X., his successor, honoured Michael Angelo no less than he had done, employing him on the architecture of the front of St. Lorenzo at Florence.

After this, in the popedom of Clement VII., he designed the architecture of the vestry, in the same church, for a mausoleum for the house of Medicis, and adorned the east and west sides with the sepulchres of Julian, duke of Nemours,

SCULPTURE.

and the duke of Urbino, opposite to each other ; with three statues on the north side, the Virgin and Child, St. Peter, and another saint. Both architecture and sculpture are still admired among the finest productions of this artist.

The fortification of the city of Florence was committed to him : he fortified mount St. Miniati ; but when the wars of Italy in 1525 obliged the artists to leave Rome and Florence, Michael Angelo was one of the number, and went to Venice ; where the doge Gritti employed him, and he made the design for the bridge of Rialto, which is one of the master-pieces of architecture. He painted in that city some pictures, and among others that of Leda, which he gave to the duke of Ferrara, who sent it to Francis I.

The wars of Italy being ended, Michael returned to Rome, and there finished the sepulchre of Julius II., after which he painted, by order of Paul III., the great front of the altar, whereon he represented the Last Judgment, it being this only which was not finished of all the paintings in the chapel.

The Last Judgment, and the ceiling of the Sistine chapel, may be considered, together, as the noblest production of modern painting existing in the world ; and it is to be doubted whether any work of antiquity could be compared with it for grandeur of conception and power of execution. He painted also, in the Pauline chapel, the Conversion of St. Paul, in which the Saviour descends in the midst of his heavenly ministers, as he addresses the fallen convert, who is surrounded by flying horsemen, and those on foot in different directions and inexpressible terror. The Crucifixion of St. Peter, on the opposite side of the chapel, exhibits the horror of the action, the patience of the saint, the grief of attending friends, and the dolorous solemnity of the surrounding multitude.

Michael Angelo, in his old age, applied himself more to architecture than to sculpture and painting. After the death of Anthony San Gallo, the pope appointed him chief architect of St. Peter's, and of the apostolic chamber, although he would have excused himself from it ; but having accepted the charge, he went to St. Peter's to examine San Gallo's model, which not approving, on account of its being a composition of parts, without sufficient reference to a whole, he caused another model to be made, which not only produced a much grander and more magnificent fabric, but at one-eighth of the expence. And this great church was finished according to the design of Michael Angelo, excepting the front, which is not his. While he carried on this building he made also several others, which constituted part of the beauty of Rome ; such as the palace of Farnese and the Capitol.

After he had arrived at the age of 80, and had withdrawn himself from most works of importance, except the building of St. Peter's, he gratified the piety of his own mind, and amused his leisure hours in working on one large block of marble a group of four figures, representing the dead body of our Saviour supported by Joseph of Arimathea, attended by two of the Maries ; a pathetic and noble composition, which he did not live to finish. It is now to be seen on the back of the high altar in the cathedral of Florence.

Michael Angelo died at Rome in 1564. He was almost 90 years of age. This great man, besides the affection of seven popes, whom he served, is said to have gained very great reputation among the following princes ; Soliman, emperor of the Turks ; Francis I., king of France ; the emperor Charles V. ; the princes of the republic of Venice ; and all the princes of Italy, particularly with the great

duke of Tuscany, who reigned when he died ; for when his body was in the church of the holy apostles, and the pope was about to set up a fine sepulchre for him, this great duke caused his body to be privately fetched away to be buried in his capital city, and performed his funeral obsequies with all imaginable pomp and splendour. This pomp was celebrated in the church of St. Cross, at Florence, attended by all the academy of design, who on that occasion gave sufficient testimony of the esteem they had for their master by the magnificent representation which the Italians call Catafalco, and adorning the whole church with painting, and sculpture, and lights. A panegyric was there pronounced over him by Messer Benedetto Varchi.

Michael Angelo's character, as a man and an artist, was equally honourable to painting, sculpture, and architecture : his integrity is unimpeached ; his generosity and gratitude were princely ; his piety and temperance were exemplary ; his studies were indefatigable ; his genius was sublime and original ; and his execution equally powerful, beyond all those who went before him and all his subsequent imitators.

John of Bologna was a sculptor of great merit, both in bronze and marble, who lived rather later than Michael Angelo : his groups are remarkable for the good composition and fine undulation of his lines, of which the Rape of the Sabines, in the market-place of Florence, is an instance. His statue of Mercury rising from the point of his toe into the air is also justly admired. Many smaller works by this artist partake in the same grace and beauty, and may be studied with advantage.

Benvenuto Cellini, who was a goldsmith and sculptor in metals, executed a fine colossal group, of Perseus holding the head of Medusa in his left hand, with the sword in his right, and standing on the body from which the head has been separated : the pedestal is most whimsically adorned with bas relief and chimerical figures relating to the subject.

After these artists, the Florentine school of sculpture lingered into a state of inanity.

Bernini was employed in Rome by pope Urban VIII., and built the noble semi-circular porticoes of St. Peter's church. His best work of sculpture is the group of Apollo and Daphne : he designed and modelled innumerable figures for the colonnade of St. Peter's and the bridge of St. Angelo ; he executed the monuments of Alexander VII. and Urban VIII. in St. Peter's ; the colossal statue of St. Longinus ; and four doctors, which support the chair of St. Peter.

This sculptor, whose works were so numerous, as he was first a painter, and formed in the Lombard school, endeavoured to embody Coreggio's style of painting in sculpture, forgetting the impossibility of representing flying draperies and the extremities of hair in marble, which is so easily done on canvas ; and which, when universally attempted, remains an equal testimony of the sculptor's want of judgment, and the impossibility of the attempt. Although there are fine ideas, in the general conception of both the papal monuments above-mentioned, by this artist ; yet his allegorical figures are affected in their attitudes, smirking and concealed in their countenances ; their forms are flabby and incorrect, and their draperies confused : yet this style, depraved and flimsy as it was, in spite of the beauties of Nature, which continually appear before our eyes, and the Grecian examples of rigid perfection which adorn the city of Rome ; notwithstanding these, it produced a train of followers, Rusconi, Algardi, Moco, &c. &c. who continued to be employed, till within these fifty years, in Italy, where

SCULPTURE.

where the flimsy materials upon which they formed themselves were entirely worn out ; and the human intelligence returning to the essence of art, which is the imitation of Nature, began the work anew, studied the principles of the ancients, and applied themselves with diligence to a representation of the human form divine.

This same mode of study has produced a new and a better school, which promises something like a just emulation of the best days of Greece, in the works of that distinguished sculptor Mr. Canova, and some other sculptors, both natives and foreigners, in Italy.

The French nation, from its vicinity and intercourse with Italy, as well as from the friendship which the early kings of France cultivated with the emperors of Constantinople, always preserved a taste for fine art in that country, and supplied the means of its improvement, both in painting and sculpture. The large collections of fine Greek manuscripts, with their numerous beautiful illuminations, were imitated by the French painters, and the nearness of the countries to each other, enabled the French artists to study sculpture and architecture in Italy, as well as the kings of that country to supply their great public works with architects and sculptors from Italy also. In the reign of Francis I. Lionardo da Vinci, Benvenuto Cellini, and Primaticcio, laid the foundation of a school of fine art, similar to that in Italy, as improved from the lately discovered Grecian works. The natives, who distinguished themselves most immediately after this period in sculpture, were Pilon, Cousin, and John Goujon, whose bas reliefs on the fountain of the Innocents deserve admiration and praise. In them is an union of the elegance of Raphael's school, with the Grecian purity and delicacy. The genius and abilities of the people, added to national munificence, have kept up a respectable school of sculpture in France till the present time.

Whatever has been done in painting and sculpture in Spain, was also derived from Italy. The native powers and virtues of the Germans, which have contributed so largely to modern improvement in arts and letters, have not been deficient in the art of sculpture. Our present limits and object will not allow us to produce many examples ; therefore we shall instance one which would be honourable to any nation, in any period. The monument of the emperor Maximilian, father of Charles V., stands in the church of St. Anthony at Inspruck : it is in bronze, and was made by Alexander Collins of Mechlin, the sculptor. The idea of this monument is as extraordinary as the effect is pathetic. Maximilian lies in his imperial robes upon his tomb, elevated about five feet from the ground. There are, at the distance of two feet from the tomb, marble steps about two feet high. On one step stand eight colossal statues of his illustrious relations ; and on the opposite step as many more facing them. They represent distinguished royal persons from the time of Godfrey of Boulogne, of whom he was one. The spectator is awed by this silent and imposing assembly, who stand in striking attitudes and solemn grief by their relation. The actions are bold and forcible ; the armour is rich and elegant in the highest degree ; but it may be objected that the ladies have something of muscular heroism in their characters.

There are several other fine statues in bronze, of inferior dimensions, representing German princes, in the same church. There is also a most noble monument by this artist in bronze, representing St. George, with one foot on the dragon, which he has just slain.

England, like the other nations of Europe, chiefly derived her arts and letters from her Roman conquerors. Also

she is not without her obligations to Christian Greece as well as ancient Greece, for the arts and learning of the different ages. Those which were called Saxon architecture and sculpture, were in fact only barbarous imitations of the provincial Roman arts. The Norman architecture and sculpture of this country were likewise an imitation of Roman art ; but through the more distant medium of the Norman French, subsequent improvements in the revival of arts were derived more or less remotely from Greek or Italian assistance ; though, in justice to the genius of the English, it must be acknowledged that their progress in the art of sculpture, down to the Reformation, kept a respectable pace with their neighbours on the continent, as may be still seen by the sculpture on the west front of the cathedral of Wells, completed in the reign of Henry III. : in Exeter, Litchfield, and Salisbury cathedrals, but more especially in the sculpture in Henry VIIIth's chapel in Westminster Abbey : in alto relievos of scripture subjects, monumental sculpture, and single statues, to be seen in different ecclesiastical structures throughout the kingdom. From the time of the reformation, when painting and sculpture were exiled from the churches, the native genius of the country was left entirely without employment ; and wherever painting was required for the decoration of palaces, or sepulchral sculpture for the churches, foreign artists were employed, and, with little exception, supplied the country with a degeneracy of French, Italian, or Flemish art. The best of the foreign sculptors who have been employed since that time were Cibber, who executed the statues of raving and melancholy madness on Bedlam gates, the bas relief on the pedestal of the London column, the greater part of the kings in the Royal Exchange, and a multitude of other statues for different buildings in various parts of the kingdom : Roubilliac, who executed several monuments for Westminster Abbey, with much labour and attention to common nature, the compositions of which, however, are either conceits or epigrams, and the parts are too often mean and vulgar. Scheemacher executed some of the statues on St. Paul's, and the bas relief in the pediment ; but he is not distinguished by pre-eminence and ability.

Since the establishment of the Royal Academy, and the frequent employment of the sculptor's talents in public monuments, the art has been practised by natives, whose own industry, studies in Rome and foreign countries, and the zealous exercise of their profession, have raised works equally creditable to the country and their own talents. Mr. Bacon's works have been much admired. Mr. Banks has left statues and basso relievos which might be ranked with some of the best works of antiquity : and some of the public monuments by English sculptors of the present day, might be compared with advantage with the ablest productions of the same kind on the continent.

In the general treatise on an art, we cannot pass over in perfect silence the productions of a great empire which has pretended to the highest antiquity in its cultivation ; the ingenuity and beauty of whose finer manufactures and more delicate works have claimed universal attention, and have been admired and collected by most of the curious. The Chinese sculpture must be noticed ; though, from the productions we have seen in Europe, and from the best authenticated inquiries, we have great reason to believe that such of their paintings and sculptures as can lay any just claim to those titles, have received most of their charms from European communication. There is great reason to believe that their smaller models and bronzes were improved from a very barbarous state. Among other branches of knowledge by Catholic

SCULPTURE.

missionaries who went over in the fourteenth century, their arts received a further improvement from the learned and ingenious Jesuits who visited them in the beginning of the seventeenth century; and again in the beginning of Louis XVth's reign, sixteen Chinese in the city of Paris were instructed in the European arts of designing, light, and shadow; optics, colour, and perspective; since which the painting and sculpture of China have become more nearly allied to the European practice of those arts than ever. These facts are attested by the known attainments of the several missionaries who have visited China; by the testimonies of the best writers who have written on that country; by the representation of European head-dresses and fashions in their works; and by Chinese subjects drawn and engraved by Jesuits who were resident in that country, and whose style of designing shew that the Chinese artists, of the same ages, formed their school of art upon the works of these men.

Motives for the Employment of Sculpture in Greece, and the Encouragement given to the Art.—The first motive for the encouragement of sculpture in Greece was religion, which induced the several states and opulent individuals to vie with each other in employing the choicest talents of their countrymen for the production of the most beautiful and approved works, to adorn their temples and public places in honour of the different divinities, which they believed to be their more immediate patrons and protectors in that state of polytheism. This species of piety became more popular; and its effects became more general from another motive, the relation which most of the powerful families of Greece claimed with the several divinities and heroes, by deducing their own genealogies from some one or more of them.

In a state of society where the families of all lived nearly in the same habits of simplicity, because the luxury and magnificence of private life created a jealousy among fellow citizens, likely to terminate in most tragical consequences; in this state of society the more wealthy employed their stores in building and equipping ships, raising troops of horse or foot, increasing the temples, placing in them magnificent tripods, beautiful statues, or other costly gifts; in strengthening the walls of their cities, and all such public works as provided for the safety, or increased the fame of their country.

Patriotism, in addition to religion, was another motive, not much less powerful than the former, for the encouragement of sculpture in Greece. The Olympic games, instituted at an early period in that country, encouraged these trials of skill to the utmost extent, which educated the human frame in the greatest habits of strength, activity, and promptness of exertion, for all the most useful employments of peace and war. They also publicly exhibited the finest forms and examples of personal beauty to the assemblies of Greece at the Olympian exercises, and by that means enabled the philosopher to analyse, the physician to enquire and deduce, the artist to form principles from nature for the perfection of his works, and the generality of spectators to judge of the phenomena of health, strength, activity, proportion, and pleasing parts of the human form, among those who were engaged in the exercises, and rendered themselves, by their prowess, ability, and fortitude, the objects of universal admiration and applause.

The immediate honours bestowed on the victor was an herbal crown, rendered equal in value to the richest diadem, by the approbation and congratulations of the whole state. The victor was likewise honoured with a brazen statue on the very ground where he had shewn himself properly qualified to be a defender of his country in war; and for prudence,

activity, and fortitude, a valuable citizen in time of peace; and if any one obtained the crown three times in these exercises, he was not only honoured with a bronze statue on the spot, but that statue was made an exact portrait of him, not only in the face, but every part of his body and limbs. These general remarks on the religion and public institutions of Greece, will sufficiently account for the immense sums expended in works of sculpture, and the prodigious multitude of these works produced in that country.

The statue of the Olympian Jove, made of ivory and gold by Phidias at Elis, was paid for by all the spoils taken from the Persians. If we might calculate a small part of this statue, only by the price of ivory at present, the covering of ivory only, which must have been perhaps the least article of expence in it, without the workmanship, could not have cost less than 2000*l.* There were 8000*l.* sterling of gold in the statue of Minerva made for the Acropolis, besides the ivory, workmanship, and all other expences.

We are besides told of another statue of the size of nature, valued at 19,200*l.*; and of another, the Venus of Gnidos, which was refused to be given up for the payment of the debts of a whole city; and thus we cannot wonder that works produced from the noblest motives, and rewarded by the highest gifts that man can bestow on man, were of a supreme excellence, which have commanded the admiration and interest of all succeeding ages.

Concerning general Beauty in the ancient Works of Sculpture.—After a general view of the motives and circumstances which produced these works in public, we shall next enquire into the more private motives, attainments, and qualities which enabled the artists to produce such works, and here we must remember the observation of Socrates, that the dispositions of the mind may be expressed by the forms of the body; and as Socrates himself was a sculptor of no mean excellence, and a philosopher of the highest character also, what he says upon this subject cannot be too carefully attended to; and indeed it applies to the progressive improvement in this art from the most rude representation of the human form to the most perfect; and to the separate consideration of the mind and its qualities, by which the human form is animated.

As it has been observed in a former part of this article, the earliest attempts to represent the human form in all nations are almost equally barbarous and imperfect; we shall, therefore, begin our description of Grecian imitation, when, by a more general comprehension of science, her imitation of its archetype was superior to such barbarous primeval attempts in general.

These attempts and their improvement have always succeeded best in those parts of the human figure which are nearest to our view, or present themselves to us as most striking and important. In such representations, the features of the face are more accurately represented than any other part of the figure. The body, the arms, and legs attract the most general and less distinct notice; therefore the first improvements in the earliest statues of Greece remaining, approach only to something like a more tolerable proportion, express the arms in general meagre long forms, with the shoulders somewhat more round and prominent, and the fingers separated by nearly parallel channels. The body is distinguished by the paps of the breast, the line of the ribs, and the navel. The legs and thighs have little more of variety in their forms than a small knee-pan, and some projection of the calf of the leg, with feet and toes formed with as little attention to nature as the hands. In this state of improvement little variety of action will

will consequently be expected. Sitting, lying, running, or striking, will nearly comprehend the whole extent of the artist's variety in a single statue or bas relief. In this state of improvement it is in vain for us to expect any discrimination between the characters of gods and men; they were all represented by the same forms: and Jupiter, Hercules, Mercury, and Neptune, were only known from each other by the thunderbolt, the bow, the caduceus, or the trident.

According to the general improvement of science, as the observation of the course of the heavenly bodies, the divisions of land, and marking out the plans for building on the ground, had introduced some practical application of geometrical lines and figures, which must precede observations on the balance and motion of bodies; and as something more like anatomical knowledge was obtained from the sacrifice of animals, or observations on the dead left on the field of battle, or a human skeleton casually found: as these assistances afforded light on the structure and movements of man; so the artist, applying principles as he became master of them, copied his example with more accuracy, and represented the parts more in detail.

The next state of improvement we shall observe is a nearer copy of ordinary nature, in which the hair, however, is straight, the eyes full, the eye-lids gently marked, the bottom of the nose and the line of the mouth curved upwards at the corners, giving a kind of smile to the face; the breast a little more prominent; some indication of the muscles of the abdomen by cross parallel lines; the hollow in the loins behind, and the general form of the blade-bones, more natural; more distinction between the breadth of the upper and lower portions of the thigh; the general forms of the feet and hands, more accurate according to their angles and divisions; and the biceps muscle marked in the arm, and the elbow. Specimens of these different steps of improvement may be seen on the Greek painted vases, particularly those which have black figures on them. There are also many small bronzes, which are demonstrations of the same progress of improvement.

In the age of Phidias, when geometry had made considerable advances, as we find by the writings of Plato, when anatomical researches had been prosecuted with success by Hippocrates, in addition to the advantages of seeing the human figure in more perfection, from the establishment of regular government, the more regular supplies of agriculture for living, and other improvements in civilization most favourable to the beauty of the human figure:—with these advantages, the human figure was represented with the distinction of youthful beauty and elegant proportion, as well as with the strength and agility which indicates a rather spare diet and great exercise, of which the statue called Theseus in lord Elgin's collection is an example.

It is remarkable, that personal beauty of countenance and elegance of form frequently occur in works about the time the Parthenon was built; although in the same works there is an evident want of proportion and perspective in some of the parts, with the most careless confusion of the drapery. But we must remember that the course to excellence is progressive, even to the greatest genius, and that all arts are perfected by the accumulation of discoveries and long practice.

Having mentioned the first dawns of beauty in Grecian sculpture, this will be the place for some enquiry concerning that beauty which so eminently distinguished their best works. A people long acquainted with the naked human form, and the exertions of the human figure, would practically learn, that a particular make was favourable to a particular exertion, as long legs were favourable to walking and

running: broad shoulders and a full chest were accompanied by strength. The observations of physicians would assist in ascertaining the more convenient form of all other parts of the body and limbs for strength and exertion; then enquiries into the animal economy of the body would assist their determinations relating to health or sickness, in the whole or the parts, according to outward appearances. All this would assist the artist in the determination of what he should choose and what he should reject in his imitations. The bloom of youth, the prime of manhood, and the parts best formed for all the uses and exertions of the body, would become his standard example for the most fortunate attempts of his art; and having proceeded thus far, he would be able the more readily to distinguish the various characters of tender infancy, the venerable solemnity of advanced age, and the graceful forms of female elegance.

But other distinctions and other characteristics still remain for the artist to become acquainted with, to qualify him for the extensive representation of gods, demigods, and heroes, human creatures and infernal beings; and this could not be done by the simple representation of common forms and common expressions, such as continually presented themselves, but by a selection from nature of whatever was most excellent in form, accommodated to the highest qualities of mind, to represent the higher orders of beings, and their opposites in those which are below humanity, and partaking of noxious and infernal nature.

Mere form, however harmonious in its proportions, or beautiful in the smoothness and perfection of its finished surface, without the expression of sentiment and action, is but dead, and no other than a corpse which has been quitted by its immortal spirit; therefore the artist's great and most important interest, after he had obtained the geometrical forms of body, was to watch the strongest most decided emotions of mind, in order to give animation to his works. It was his concern to investigate and represent decidedly the strongest affections, conjugal, parental, social, and filial; the sentiments of piety and religion; the incitements of passion in their different degrees, whether of love or hatred; for by these means only his works fastened on the kindred affections of the spectator, and obtained his esteem.

The Greek artists who gave these first mental improvements to their works, sought for nobility of sentiment and distinct characters of gods and heroes from the writings of Homer; illustrated by the speculations of Pythagoras and Plato upon the essential qualities of divinity, in their omnipotence and extent, and the limited powers of humanity, derived and finite.

From these they learned that all bodily perfections and beauty were derived from mental beauty and perfection; that as forms which expressed healthful bodies and their parts were the most perfect, as far as form and animal power extend; so the expressions of the most perfect mental qualities added the most perfect animation of beauty to those forms, and gave the most perfect characters of magnanimity, justice, benevolence, and dignity to the faces and figures of their divinities, and in an inferior degree to their heroes: and whatever perfection of face or person they would express, they found could only be done by the sentiment of that virtue and beauty of men by which it was immediately caused.

Jupiter, the chief of their gods, was represented in the most perfect human form; powerful in his make, benign in his countenance, and of that mature age when wisdom is united to the full development of the bodily powers. His full beard and abundant flowing hair are consistent with the greatest dignity the human head is capable of; and the lion-like

SCULPTURE.

like hair and forehead decide the magnanimity of the character. The broad chest, the strength and proportion of the limbs, the whole solemnity of the person, at the slightest view, announces, according to the Homeric expression, the father of gods and men.

The next divinity in dignity to Jupiter is Apollo, whom we can readily believe to be the exact representation of his father, in the dignity of youth; his features are his father's in youthful bloom and beauty; the form of his body and limbs partake of his father's strength in youthful lightness and agility; his countenance is adorned by his flowing locks, according to his age, more light and varied than his father's; his sentiment and employment are also suited to his age and more limited offices. Jupiter, seated on his throne, has little action or corporeal employment; his mental energy regulates the universe by his nod; and his single exertion is the discharge of his irresistible thunder. Apollo is seen in love, in meditation of immortal poetry to accompany his lyre, destroying Python, meditating the cure of diseases, or inflicting death by his arrows.

Bacchus resembles his brother Apollo so exactly, that they cannot always be distinguished one from the other; yet he frequently partakes of a more feminine nature, according to the Orphic description of his double sex.

Mercury, with the same beauty as his brother, and the same youthful resemblance to his father, has a more athletic form, approaching to heroic, as being the patron of gymnastic exercises, and messenger of the gods. His hair is short; he wears a small round hat or petasus, which is winged; he has also wings to his ankles.

Mars differs little from Mercury in form or countenance, excepting that he is sometimes bearded, and frequently wears a helmet upon his head, or is dressed in complete armour.

Neptune resembles his brother Jupiter, but his hair is more disturbed, and he is in general entirely naked.

Pluto also resembles Jupiter and Neptune, but his eyes are more staring and spectre-like; his abundant hair falls more over his forehead, and gives a greater gloom to his countenance: he is clothed in a tunic and pallium, holds a sceptre in his left hand, and is attended by the triple-headed dog Cerberus.

The goddesses are less distinguished from each other than the gods. The height of female beauty, in dignified figure, with noble mien, is common to them all.

Juno is represented with a regal diadem and sceptre, generally clothed in the tunic and peplus, or large veil: her countenance is lofty; her eyes and lips are full; her hair is turned up, and tied in a knot behind in simple majesty; her veil is sometimes over her head.

Minerva is distinguished by the serene austerity of her countenance, and the wisdom of her character. She is armed with a helmet and ægis, and bears a spear in her hand, but in other respects is dressed like Juno.

Venus is distinguished by her tender softness and graceful action; she is represented as parting her hair and rising from the sea, modestly covering her person as returning from the bath; or dressed in a light and thin tunic or veil, and engaged in those concerns of the toilette to heighten or preserve beauty. She is frequently attended by Love, who is represented as an infant divinity.

Vesta and Ceres have much the appearance of Juno; the first distinguished by her lions and mystic drum; the other by ears of corn.

Diana has her hair collected on the top of her head; like her brother Apollo her tunic is succinct, not reaching lower

than her knees, its length being shortened by the tying of her zone; she wears buskins, and is generally running, or in an attitude which relates to the chase.

Hercules, the first of their heroes, and who in early times was one of their greatest gods, was not represented with that irresistible strength and muscular force in the time of the first Greek sculptors, in which he was represented afterwards, and he changed his arms as well as his figure, for before the time of Æschylus his arms were a bow and sheaf of arrows; but as his labours became such as required more natural force, according to later mythologists his bodily powers were increased, and his arms changed from the bow to the club. His strength is proverbial, and his powerful form known to every one, by his numerous representations in sculpture and painting. It is well remarked by Winckelman, that in the likenesses found in the antique statues between the faces of Hercules and Jupiter, there is a character of the bull given to the head of Hercules, by the short hair and the bull forehead. As a proof that this mixture of the bull in the head of Hercules is not fanciful, there are busts representing a mythological modification of the Herculean character, with the bull's ears, horns, and dewlap.

We shall describe the fawns as one class, companions and ministers of Bacchus; in this class we shall mention the Sileni, the foster-fathers or nurses of Bacchus, one of which is a dwarfish figure, with a round belly, fat limbs, a Socratic merry face, a bald head, a long beard, undulated and divided; his body is more or less covered with hair. This Silenus is also occasionally called Ampelus. The other Silenus is a well-proportioned elderly man, rather a spare figure, with a philosophical countenance, with a head and beard bearing some distant resemblance to Jupiter. Both these Sileni are crowned with ivy, and have pricked ears.

The fawns have round faces, short noses, and a grinning expression; their hair is short, stiff, and like that of a goat. Their bodies are strong, their muscles tendinous, like those of wild animals, and suited to the elasticity of their actions; they have short goats' tails.

The satyrs have goats' legs, their bodily conformation like the fawns, they have pricked ears, sometimes long goatish beards, and frequently faces resembling rams or goats.

The Titans and giants are Herculean figures to the waist: some of them have the lower limbs human, and corresponding to the upper part of their figures; others from the middle end in serpentine folds instead of human legs. Their heads have an Herculean character, full and terrific; there are serpents in their hands, perhaps relating to their infernal punishments.

Ocean and the divinities of seas are all Herculean figures, in countenance resembling the Saturnian family in youth or age; they are generally naked, though some are veiled downwards; and Ocean himself has a veiled head. The inferior divinities of the sea, as the family of the Tritons, and their various distinctions, have hair, faces, bodies, and arms like the fawns, but with finny hair and gills, their lower halves ending in the tails of fishes, horses, bulls, &c.

The geniuses of mountains are robust figures, with solemn countenances, flowing hair and beards, crowned with pine, oak, &c.

The nymphs of Earth and Ocean are beautiful entire female forms, with hair sometimes flowing, sometimes tied in playful attitudes. The marine nymphs are frequently collected in affectionate groups, and employed in stretching out their flying veils to the wind.

The Three Graces are the beautiful female companions and attendants of Venus; they are represented as three beautiful

SCULPTURE.

beautiful virgins, in the flower of youth, embracing each other.

The nymphs of Diana are habited like their patroness.

The Furies are handsome, but with a terrific expression of countenance; their hair dishevelled, winged, and with two small serpents rising from the tops of their heads. Their dress is a succinct tunic, like Diana's, and they have snakes and torches in their hands, to torment the wicked.

What has been said is sufficient to convey a general idea of deified personification in Grecian mythology; but those who have occasion for a more intimate knowledge of their system of theology, and its different relations, as well as its innumerable allegorical forms and monsters, must be referred to their poetical and mythological writers, and the various publications of ancient painting and sculpture, with their illustrations by the learned.

Concerning the Beauty of Parts in the Human Figure, its Balance and Motion.—The ancients have observed that the human figure is inscribed within the square and the circle; the square, when the feet are close together, the posture upright, and the arms extended in a parallel line; when the length from the extension of the opposite finger is equal to the whole height, from the crown of the head to the sole of the foot; which general observation leads to the determination, not only in the position of the body and limbs, but to the balance of the figure, by geometrical lines. The human figure being laid upon its back, the arms and legs, extended like the spokes of a wheel, may be inscribed in a circle, the centre of which is taken from the navel. When the figure stands upright, equally poised upon both feet, the centre of gravity falls in a perpendicular line from the gullet between the two ankles.

When the figure rests on one foot, the centre of gravity falls from the gullet, perpendicularly on the bottom of the tibia bone of the leg on which it rests.

If the figure is in equipoise, the centre of gravity falls from the gullet between the legs.

In advancing from that point before the leg, and in swift running, it is at every interchange of step far before the foot which is next to be placed on the ground.

The figure, in bending sideways to balance itself, must still retain an equality of weight round the centre of gravity, to preserve its balance by stretching out the opposite leg or arm.

For further satisfaction concerning the motion of the human figure, consult Borellius de Motu Animalium; Cowper on the Muscles; and Lionardo da Vinci on Painting.

To obtain a more positive idea of the form of the human figure, as well as its balance, together with the breadth of its parts, a reference to a geometrical figure is particularly useful. For instance, view it in profile, and we shall see that its column or general mass is not perpendicular, but consists of undulations, through the middle of which we may suppose the centre of gravity passed perpendicularly downwards. The head is thrown forward over the neck and the breast, to serve as a counterbalance with the breast against the projection of the shoulders; and the projection of the nates counterbalances that of the abdomen; so that the back-bone beginning from its uppermost joint, which immediately supports the skull, after being a little curved inwards, though nearly straight for the first seven joints, afterwards forms a bold curve outwards between the shoulders for the next twelve joints downward to the loins, partaking in the same hollow with the ribs, to contain the organs of the thorax.

The projection of the thighs in front is opposed lower down on the opposite side by the projection of the calves

of the legs; not only for a counterbalance, but also for counteraction; and for the same reason the bending forward of the body from the head downward is counteracted by the length of the foot, and its resistance for support.

The general form of the head, viewed from the top, is circular, being larger at the back of the head and narrower at the forehead. The general view of the head in front is egg-formed. The simplest character of the profile is that of the nose, little differing in straightness from the line of the forehead; the lips and chin making small projections, each about a quarter of a circle. This is the most general and simple idea of the human face, and that principle upon which most of the ancient ideal heads are formed. Force and passion are deviations from this principle by the application of curves in the outline more or less bold, and the face of infancy is described by one portion of a circle forming the forehead, and another the cheeks, with a small nose between.

In the ancient sculpture, the most perfect necks for youth, beauty, and strength, are nearly circular, like the portion of a column. The breasts are elevated and broad; the line of the ribs is nearly a portion of a circle gently expressed, a little below the nearly straight line, which terminates the breasts above. The abdomen has a gentle channel from the pit of the stomach to the navel. The lower muscles of the abdomen to the os pubis are a little swelled and nearly plain. The sides of the ribs under the arms are marked with gentle divisions diagonally, tending downwards in front, which indicate the ribs and muscles which immediately cover them. The back of the trunk between the neck and the loins is a curve outwards, as has been already described; and the spine, or back-bone, which is the pillar of support to the upper part of the body, the arms, and the head, shews behind as an indenture between the two rounded portions of the back, on which the blade-bones and their muscles form a gentle and rounded flattened swell immediately below the neck. The commencement of the arms, as they are affixed to the body, has a bold and rounded form, in the upper part of which is united the head of the upper arm-bone, to the end of the collar-bone before, and the blade-bone behind; the arm, beginning at the separation from the trunk and continued to the wrist, is a diminishing cylinder. The upper arm finishing at the elbow is broader, and sideways flatter than the lower arm. The lower arm is flattened the contrary way, and less than the upper part of the limb. The wrist is a rounded flattened form in youthful bodies full of flesh. The hand is hollowed within, and a little rounded without; the thumb extends to the first joint of the first finger; the middle finger is the largest; the next finger outwardly is next in length; the finger between the thumb and the middle finger next in length; and the little finger shortest of all: they are less in bulk as they are shorter, and diminished downwards cylindrically. The male hand and finger has more of breadth and flatness; the knuckles are more square and decided even in youth. The female hand is more rounded and fleshy; the fingers are more perfectly cylindrical and tapered, the knuckles less decided, having little more distinction than gentle hollows in the more constrained positions of those knuckles, which unite the fingers to the hand. The nails in men are more squared, in women more rounded, long, and delicate.

The loins of the body are in the side view considerably curved in from the ribs, and project again in a gradual obliquity from the bottom of the ribs to the bottom of the nates. In the front of the figure, the trunk terminates at the os ilium or basin bone, which is marked immediately before the projecting muscles, which terminate the line of

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SCULPTURE.

the trunk, and immediately above the setting on of the thigh, and is marked with a strong line obliquely descending to a point at the greatest projection of the os ilium in front, and forming from thence a nearly inverted semicircle to the top of the os pubis.

The thighs are fullest and roundest immediately at their separation about half way downwards: they gradually diminish toward the knee.

In the upright figure the knee-pan above, with the skin and fat immediately below it, form what is altogether generally called the knee-pan, of an oval figure, and is the great distinction of the knee in front, between the thigh and the leg. The inner line of the principal bone of the leg, or tibia, is a little curved outwards in a hollow of about 30 degrees. The inner ankle is higher than the outward. The calf of the leg is most projecting, near one-third of the way from the joint to the bottom of the heel, and behind in a flattish forked division, sends a strong muscle united with the tendon of the heel, making together the backward profile of the leg. The outside of the leg has its principal curvature rather lower than the inside. The toes are shorter than the fingers; the longest toe is next to the great toe; the great toe is the broadest; and in those not used to wear shoes, divided from the second toe by a considerable separation. The three toes on the outside of the foot are shortened in a diagonal line. The characteristics of the male and female in this extremity are nearly the same as in the hand.

In stronger figures the joints are marked with more strength and complication, the muscles are more decided, more of the tendons are seen, and occasionally the veins, particularly towards the lower parts of the extremities. The fleshy projecting parts of the figure in old age are more flattened, which indicates the diminution of elasticity as well as muscular strength.

The female figure is generally about one-tenth shorter than the male; its bones are more straight, and less rugged towards the joints, as the attachment of its muscles are slighter; the forms of the body and the limbs are more rounded: the differences of the male and female bosoms are well known. The shoulders of the female are narrower in proportion than those of the male; the loins are narrower and the hips are broader.

In infancy, although the proportions are very different from the adult male or female, yet the roundness of the limbs and body, little distinguished by the marking of bone at the joints or projecting muscle between the joints, approaches nearer to the smooth and generally rounded surface of the female figure.

Vitruvius informs us, from the writings of the most eminent Greek painters and sculptors, that they made their figures eight heads or ten faces high, and he instances different parts of the figure measured according to that rule. The great M. Angelo adopted this rule, as we see by a print from a drawing of his. We shall adopt this method in giving the most general proportions of nature and the Greek statues.

Proportions.—Divisions of the human figure in length. From the os pubis to the top of the head, one-half of the figure; from the same point to the sole of the foot, the other half.

There are three equal divisions from the acromion of the scapula to the bottom of the inner ankle. 1st. From the acromion to the point in the spine of the ilium, from which the rectus and sartorius muscles begin. 2dly. From thence to the top of the patella. 3dly. From the top of the patella to the bottom of the inner ankle.

From the bottom of the os pubis to the bottom of the patella, is the same length as from the bottom of the patella to the sole of the foot, two heads each; but we must observe, that the ancients generally allowed half a nose more to the length of the lower limbs, exceeding the length of the body and head.

The arm, from the top of the humerus to the bend, one head and a half; and from the bend of the arm to the first knuckles, the same.

Breadth of the upper arm, one nose and a half; side view, two noses; lower arm, thickest part, one nose and a half; wrist, one nose.

Breadth of the shoulders, two heads; of the loins, one head and one nose; across the hips or trochantères, one head and two noses. Depth of the chest, one head and one-third of a nose; of the loins, three noses and one-third; of the glutæi, one head. Breadth of the thigh, three noses; of the calf of the leg, two noses; of the ankle, one nose. The foot is one head and one nose in length.

The female figure should not be so tall as the male. The shoulders and loins should be narrower, and the hips broader.

The proportion of the Hercules Farnese and the Torso Belvidere are nearly one-fifth more in breadth than other statues.

But the ancients varied the proportion according to the character and age of the person. There are examples of the Silenus, and Hercules also, when he partook of the same character, exceedingly dwarfish, not exceeding four or five heads in height; and there are examples on some of the Greek vases of figures nine or ten heads.

Drapery.—To introduce our observations on the draperies of the antique statues, we will first enumerate a few of those garments in which they are most generally clothed; and we will begin with the largest and coarsest woollen garment, called the pallium, which was a large piece of square, or squarish cloth, perhaps about seven feet long, but not so wide; this was generally worn by being folded over, perhaps one-third of the breadth: one end applied to the left side of the body, carried under the right arm, and thrown over the left shoulder in front; it formed broad and simple masses before and behind, with a few bold and distinct folds, which left the body and limbs well accounted for beneath. It was, according to the convenience of the wearer, thrown in a variety of different manners: sometimes one arm was wrapped in it, sometimes the other, and sometimes nearly both; all the statues of philosophers, excepting the Cynics, are clothed in this manner.

There were other garments nearly of this kind, which are very commonly seen; particularly the manly peplus. The figures of Jupiter and Esculapius are sometimes seen wrapped in the peplus, which appears to have no other distinction from the pallium, than that it is made of a finer texture, consequently produces fewer and more numerous folds, and its corners are sometimes ornamented with tassels, or knots.

The chlæna seems to have been a finer and lighter woollen garment than the peplus, much less, but, like that, of a long square; this garment is particularly appropriate to youthful heroes, and is seen on the colossal statues of Monte Cavallo, the Meleager, and many youthful heroic figures on Greek vases, and the young heroes in the frieze of Horsemen in the Parthenon at Athens.

The tunic, or kiton, was an under garment, also worn by men in early times; this had no sleeves, and hung over the left shoulder, leaving the right shoulder entirely bare, not to impede action; in after times it had short sleeves, was full in the body, and when not girded, hung down below the mid-leg;

leg; but when collected by the girdle, did not reach lower than the knees. This seems to have been made in general of the same material with the *chlamys*. The *chlamys* is a military and hunting cloak, fastened with a button on the right shoulder, as that worn by the Apollo Belvidere.

Female Drapery.—The *kiton*, or tunic, was worn by the Greek women in very early times, but was generally made to pass over each shoulder, excepting Amazons, or female warriors, who sometimes had the right shoulder left bare; but the female *kiton*, or tunic, reached to the feet, and was lower than the ankles, even when girded by the zone. This was made of a finer material than that worn by men: it is called *bombyx*, and appears to have been produced from a thread woven by wasps, or insects of that kind, and to have formed a delicate and fine texture, capable of producing long and variegated folds, without lessening the distinct appearance of the figure underneath.

The *peplus*, or long veil, is described as a dignified garment by Homer; it was worn nearly in the same manner by women as by men, and is a characteristic of dignity, as Juno, Minerva, Vesta, and Ceres are seldom or never seen without it in a placid state.

Besides the *kiton*, the dignified female Greeks had another garment, which answered the same purpose, called the *peplon*, which appears to have been one piece of cloth doubled over at the top, folded round the left side, the left arm having passed through the top; open on the right side, which presented two cascades of folds: these are continually seen on the Greek vases.

Many other garments were worn by women, which frequently occur in statues, basso relievos, and painted vases, which answer to our shifts, petticoats, handkerchiefs, and bodices, and are easily distinguished in the works of ancient painting and sculpture; but as a more intimate acquaintance with those concerns the antiquary rather than the artist, we shall refer those who are curious on the subject to lexicons and scholiasts for further information.

The Roman toga appears to have been originally Italian, and was so entirely appropriated to the Romans, that they are thence called *gens togata*. Collected in its folds, it appears to have been of an oval figure, through the opening of which the head, the right arm, and half the body on the right side passed, the garment resting on the left shoulder, being supported by the left hand, falling below the middle of the right leg, and presenting almost innumerable continued curvilinear folds, which encircle the figure before and behind from the left shoulder downwards. A lap of this garment was brought from behind over the left shoulder, tucked into the upper part in front under the right breast, which fold was called the *cinctus Gabinus*, and was said to be a fashion brought from the city of Gabia. It was worn by emperors, consuls, noblemen, and Roman citizens: in general it was made of a fine woollen cloth, as most of the Roman garments were.

In reflecting on the beauty of drapery, we must always refer to the beauty of the human figure which it covers; and as garments are worn for a defence against the weather, or from motives of modesty, they should never be such an incumbrance as to impede action or overload the figure, either by their quantity or mode of wearing; which rule being observed, the general idea of form and action will always be intelligible underneath; and thus, however the figure may be covered, the plainer parts of the garment will give a breadth of light and shadow to the mass, and its folds a beautiful variety of form, either in harmony with, or in opposition to, the forms of the limbs and body.

The cascade, or zigzag fold of a long full garment hanging

from the shoulder towards the feet, by the irregular geometrical effects of its light and shadow, shades the undulation of living forms on the opposite side of the figure, whether covered with drapery or not, with an advantageous variety.

The fine and web-like draperies, such as that of the Flora Farnese, shew all the forms of the body and limbs with nearly the same distinctness as if they had remained uncovered, at the same time that the gentle radiated curvilinear folds, upon a near examination, contrast the beautiful forms of the body by a variation of lines tenderly assimilated with the flesh, in such a manner as induces the spectator to believe that the least motion of the body will produce a different, and equally pleasing new arrangement in the folds of the drapery.

What has been said concerning drapery comprehends the principles of the subject; for it was the intention on the fine statues of antiquity to produce a noble breadth by their draperies, consistent with the dignity of their most illustrious characters. In their more delicate characters they contrasted the beautiful form beneath by the graceful display of lines in the drapery; and in all their clothed statues, they adorned the forms of the naked figure by perpendicular, curvilinear, pendant, or zigzag folds, contrasting the forms, and adding quantity, but leaving the figure and its position perfectly intelligible.

In the figure of Bacchants in violent action, the flying drapery becomes peculiarly ornamental; verging from the figure in undulating rays, which at its edges and extremities play upon the air in bolder forms, like the extremities of the poppy-leaf.

The Practice of Sculpture.—The first operation of sculpture, like that of painting, is design. The sculptor first makes his idea evident by a sketch or drawing; he then makes a small model, generally in clay, to try the effect of his lines, forms, and light and shadow, as well as the sentiment of his statue, or composition: but if the work requires the utmost accuracy and perfection he is able to give, he makes a model of the size in which the wood, marble, or bronze is to be executed.

He models his figure first naked in its just action, and accurate in its forms; he then lays on his drapery, either from studies made after the living figure, or drapery laid for the purpose on a lay figure, or mannikin.

The clay model, if large, must be supported by a framework of iron; and the masses of clay may be kept together by a number of small wooden crosses attached to the iron frame-work, by wires of different lengths dispersed in different parts of the clay. This method is used by Mr. Canova, the celebrated Venetian sculptor.

The tools used by the modeller are made of wood, or ivory, with ends pointed, rounded, square, or diagonal, with which he forms his models; marks out the hollows and dark parts; and does whatever he finds impracticable to perform with his fingers only.

When the clay model is finished it must be moulded and cast in plaster; which cast must also be well supported and secured by bars of iron well cemented, to prevent the rust of the metal from penetrating through the cast.

To copy the model in marble is performed in the following manner. A number of little black points must be marked upon the model, in every principal projection and hollow, to give the distances, heights, and breadths, sufficient to copy the marble with the greatest exactness from the model. The ancients performed this, by considering every three points on the figure as a triangle, which they made in the marble, to correspond with the same three points in the model,

SCULPTURE.

model, by trying it with a perpendicular line, or some other fixed point, both in the marble and the model.

The moderns perform this operation in another manner. After, by taking rough measures, they have found that the block of marble is sufficient to make the statue equal in size with the model, they then fix it on a basement of stone, or a strong wooden bench, called a banker; in the front of which is a long strip of marble, divided into feet and inches. A strip of marble, divided exactly in the same manner, is placed in front below the model; and a wooden perpendicular rule, the height of the whole work, which is capable of being moved from the strip of marble or scale under the model, to the strip of marble or scale under the marble, at the workman's pleasure. This instrument being first placed upon the scale of the model, and the exact distance being taken, from its perpendicular, we will say, to the point at the end of the nose of the model, and the perpendicular rule being transferred to that scale on which the marble is placed; the workman cuts away the marble from the perpendicular rule at the same height, till he has arrived at nearly the same depth that the point of the model's nose was from the rule; and by this means, he finds the point of the nose exactly where it should be in the marble. He proceeds in the same manner with all the other parts of the figure; for example, the top of the head, the chin, the shoulder, and every other part of the body and limbs; until, by cutting down the marble at the same height and depth from the perpendicular line of the rule that he desires to transfer from the model to the marble, he finds a corresponding point to that he has taken from the model; and so goes on until he has obtained the general proportions of the whole work.

When this is done, the sculptor proceeds to work over his statue with a flat-ended steel tool, called a chissel, whose square end is about five-eighths of an inch broad. In the naked parts of the statue, and wherever there is a flat surface, he proceeds in this manner: for instance, we will say, upon the breast of the figure, he cuts away the rough surface from a given point in a straight line, to another given point at some distance; he then cuts away the surface from one given point to another, exactly parallel to the course his chissel went before; he then cuts the marble in a line at right angles with the former direction of his chissel. He continues to work over the surface in the same manner, continuing to cut it away in lines parallel to each other, leaving the space of about one-eighth of an inch between each course of his chissel: he afterwards cuts away the remaining rough surface of one-eighth of an inch between each two courses of his chissel; thus obtaining a beautiful flat surface to his work, which can be done by no other means, and may be afterwards varied with the curvatures and indentures of lesser parts at his pleasure.

This method of cutting the stone is followed, as much as possible, in all parts of the work; that is, as much as all the varieties of outline and hollows will permit.

When hollows are so deep or intricate, that they cannot be cut out with small chissels struck by the hammer, drills of different kinds are used to produce the rough hollows, which are afterwards finished with the hammer and chissel, or by long tools fixed in wooden handles, used by the hand only, without the hammer.

A particular dexterity is requisite in producing the different characters of the hair with the chissel, to make it look light and soft, whether curled, crisped, or plain; and this may be done by the hand of the practised sculptor, with nearly the same effect as it can be by the painter, in laying on his colours with the pencil.

The finishing of flesh in imitation of the fulness of muscle, the apparent pliability of the softer parts, the greater or lesser durability of tendon and bone, may also be represented on marble nearly to deception; but then the sculptor must be well acquainted with the structure and appearance of the parts he represents, and accurate in copying the object of his imitation. To inform the mass with life and sentiment, whether it be of marble, bronze, wood, ivory, clay, or wax, is the very end and purpose of imitative art.

The last finish of marble, in the modern practice of sculpture, is performed by the use of rasps, and afterwards of files. The best rasps for sculpture are those made in Italy: the teeth of these rasps being cut more sharply than those made in England, at the same time that the ends of these rasps and files are capable of being bent in any form, according to the use for which they are to be employed.

When a piece of sculpture is required to have an exceeding smooth surface, the pumice-stone is used after the file; and sometimes the whole surface is rubbed or ground carefully over with small pieces of grit-stone, accommodated to the various forms of the surface, as to flat spaces, rounds, and hollows of different depths. But the hair, in all cases, must be finished with the tool; and for this purpose, the edge of the tool must be sharpened with great accuracy and acuteness: and if it is required that the work should be very highly finished, the last edge of the tool must be given by an oiled Turkey-stone.

Chissels may be sharpened, for the different kinds of work, either on one side, or on both sides, horizontally, diagonally, circular, or pointed.

The sculptor uses large square four-footed strong stools, with tops which turn round upon little balls of brass or iron, on which he places the marble statue he works on. His tools are steel chissels of different sizes and lengths; their ends being from an inch broad, and diminishing in succession, till they become perfectly pointed. These are worked with an iron-headed hammer, weighing from two to four pounds, according to the heaviness or lightness of his work. The first tools used in wasting away his marble are strong steel tools, sharpened nearly to a point; which, being struck with a heavy hammer obliquely, knock off the waste marble in much larger pieces than a broader pointed tool would do.

The practice of the sculptor also requires the frequent use of the square and compasses, as his own ingenuity may direct.

There are some few fragments of marble statues, which have been found in different parts of Greece, especially where the works of sculpture have chiefly flourished, as Athens, Ægina, and Corinth, which appear to be the remains of very early attempts in this art; perhaps in an age when making the proper tools was either not known, or during the infancy of their invention. From these specimens, the edges of the tools, and the manner of using them, appear to have been equally imperfect: the course of the tool is infirm, indirect, and ragged; the surface it passed over, irregular. In the naked figure, the muscles are little determined, and the forms confused by the unpractised manner of working. In the draperies, the edges are undetermined, and the hollows are few and shallow; a natural consequence of the workman's want of power over his material; and therefore, of his desire to produce his idea in the gross, because he knew his incapacity to render a distinct and perfect detail.

High finishing in marble seems to have been a consequence of working in bronze, for two reasons: first, the working of metals requires a considerable knowledge in the

tempering of tools; and, secondly, the first high finished specimens of remaining sculpture seem to be imitations of bronze statues, from the hardness of execution resembling that of metal, and the rectilinear wiry forms of hair and draperies. Whether this manner of finishing marbles was first introduced by Dipænus and Scyllis, according to our former supposition, or whether it was practised nearer the most distinguished epoch of art, it is certain that the working of marble with the greatest possible dexterity, such as distinguishing small folds from one another, by cutting the marble to a great depth between them, was practised considerably before the time of Phidias.

In the time of Phidias, it is certain the sculptor used chisels of all the different forms described above, of the most convenient forms possible for their works, and most perfectly tempered; of which we are assured, by tracing the forms of the several instruments in their execution, which is as free and characteristic of the parts imitated as could have been produced by the pencil of the painter.

The Laocoon, the Apollo Belvidere, and the Venus de Medicis, appear to have been executed by the chisel only, without the assistance of the rasp or file, though there is, in the body and limbs of the Apollo, some appearance of a smoother surface having been obtained by rubbing with pumice-stone or wet grit-stone. Many others of the finest works of antiquity, statues, groups, and busts, appear to have been finished with the chisel only, and the use of rasps and files does not seem to have been very common in the practice of sculpture, till after the time of the twelve Cæsars.

The execution of sculpture seems to have descended from perfection in the same steps by which it rose to it. In the age of Adrian and the Antonines, extreme high finishing was again in estimation; the surfaces were finished with a delicacy of smoothness which almost became a polish; the sculptor tried to make the extremities of his hair fly before the wind, and for this purpose laboured his marble with a delicacy of tooling, and a complication of drilling, that is almost miraculous; and there are examples of hair, so laboriously executed in that age, that the spectator is left in doubt concerning the possibility of paying the sculptor for his work, the time necessary to accomplish the undertaking, and for the instruments requisite to produce his effect. There are many examples of this kind in the portraits of M. Aurelius and Lucius Verus; particularly two colossal busts of these emperors lately existing in the Villa Borgheze.

But the extreme attention to a polished surface, and extreme perfection of inferior pursuits, having withdrawn the artist's mind from nobler conceptions and sublime sentiment, he soon descended from the sculptor to the stone-cutter, and lost his distinction even as a mechanic, by adopting such a poverty of workmanship as was suited to his debased pursuits; and the age of Constantine exhibits the sculptor as incapable of following the noble conceptions of earlier times, as of shewing any skill in the mechanism of his art superior to the unmeaning and unsuccessful attempts of a barbarous age.

During the ages of the Roman emperors, when beautiful and expensive marbles were used to adorn their palaces and public structures, when the magnificence of effect was considered without relation to expence, porphyry also was manufactured for columns, pannels, and other architectural purposes: it was also occasionally employed in sculpture, in defiance of the extreme difficulty and expence of the labour, of which we shall be enabled to judge from an instance mentioned in Winckelman's History of Art: he says that a mason was employed to hollow out a vase in the Villa Albani, the inside of which could not be above thirteen or fourteen inches deep, and eight or nine inches in diameter; he was

ten months at work upon this, attending his labour regularly nine hours every day. Such a work in England, as masons are paid at this time, would cost sixty-five pounds; the payment of the journeyman sculptor should be reckoned at twice that sum.

There are fragments of drapery-figures executed in this material of fine taste and beautiful sculpture, the labour of which must be excessive; but the two greatest works remaining of this marble are in the pope's museum; one is the sarcophagus of Constantia, daughter of Constantine; the other of Helena, his mother; which last is of enormous dimensions, and covered with alto relievo of soldiers on horseback, and the heads of the emperor and his mother, angels sitting, with festoons on the top, &c. Many parts of the alto relievo on this sarcophagus were broken when it was removed into the pope's museum, which were repaired by the following process. The pieces of porphyry intended for the restoration were first rudely shaped with a picking hammer, that is, one end of the hammer being pointed, the workman knocked the stone with repeated blows of this point, until he beat off little pieces, when it was reduced to the general form required: in this manner another instrument was used, called a matting hammer, one end of the hammer being divided into four points, and being worked over with this instrument, the whole of the former very rough surface was made somewhat more regular; after this, pointed tools were used, struck by a hammer, to take off as much as possible the still remaining roughness of the surface, and to make particular hollows more exactly, the workman wearing spectacles all the while to prevent the splinters of the stone from flying in his eyes, which otherwise would blind him in the course of a few minutes labour. The tools for this work are tempered to the hardness of a razor, and seldom bear more than four or five blows with the hammer before the points are broken. The last process is to grind the surface down with grit-stone and emery, till a smooth face is obtained; the whole being a process of immense labour and expence. The Egyptian obelisks, which are of red granite, with the hieroglyphics upon them, must have been wrought by a process somewhat similar to the manner of working porphyry.

Of Wax-Modelling.—Wax-modelling is properly a branch of sculpture, inasmuch as it affords patterns and examples for very numerous articles of fine art in metals: although, from the nature of the material, no wax model of the Greek or Roman times has come down to us, they must have been almost innumerable during the best ages of Greece and Rome, judging only from their small figures of divinities in bronze, of which, perhaps, upon an average, every person, rich and poor, might have half a dozen, so that the amount of these small images, from patterns of wax, would be nearly six times in number of the population of the civilized world at any one period.

Wax-modelling besides is required for the patterns of all goldsmiths' and chasers' ornamental work upon a small scale. All the fine medals of the popes were copied from small models in wax of the most distinguished sculptors.

To make the best modelling wax, take two cakes of Virgin's wax, break them in pieces, put them into a clean pipkin, and add the quantity of the smallest hazel-nut of Venice turpentine, and about double the quantity of flake white reduced to the finest powder; place the pipkin over a slow fire till the wax is melted, stir the composition together, and it is the best wax which can be used for modelling.

Models of different coloured wax may be made by putting pounded red, blue, yellow, &c. instead of flake white, according to the colour required.

Wax-modelling is performed, like the same art in clay, by pointed instruments of wood and ivory.

Sculpture in bronze and silver is practised in the same manner by the model as Pliny describes it to have been done by the ancients, and is of three kinds. The subject is either cast from a model, or carved from the solid metal, or chased from a model upon a flat piece of metal, which is beat hollow on the one side, to produce the relief, out of which the chaser works the intended figure or figures on the other side. The instruments used in chasing are, for small works, a small hammer with a long elastic handle, which gives the blow a quick and artificial force; also chisels and points, somewhat like those used in the sculpture of marble on a smaller scale.

The tools for carving in wood are so universally known to carpenters, upholsterers, and the different orders of wood carvers, that the description of them would be useless.

For further illustration of this article, the reader is referred to the engravings which are distinguished by the word *Sculpture*. These consist of select specimens of the sculpture of different ages and nations; particularly the finest examples of Greek and Roman sculpture.

SCULTENA, or **SCUTENA**, the *Panaro*, in *Ancient Geography*, a river which commenced on the south of the Apennine, and pursuing a northerly course, discharged itself into the Padus or Po.

SCULTETUS, or **SCHULTZ**, **JOHN**, in *Biography*, a distinguished surgeon, was born in the year 1595 at Ulm, where his father was a water-man. The latter was enabled to afford his son a good education, and sent him to Padua, where he studied medicine under Spigelius, and took the degree of doctor in philosophy, surgery, and physic, in the year 1621. On his return to his native city, he was admitted into the college of physicians in March 1625; and for twenty years he practised his profession with great reputation. Being sent for to Stutgard, to administer professionally to a sick gentleman of that city, Scultetus was there attacked with a fit of apoplexy, which terminated his life on the first of December 1645. He appears to have practised surgery extensively, and to have been very bold in his operations, especially in those of bronchotomy, of the trephine, and for empyema. His principal work is entitled "*Armamentarium Chirurgicum, 43 Tabulis ære incisus Ornatum*;" and was published after his death, at Ulm, in 1653. It subsequently passed through many editions, and was translated into most of the European languages. Eloy Dict. Hist. de la Médecine.

SCUM, or **SPUME**, *Spuma*, a light excrement arising from liquors, when briskly stirred; called also *foam* or *froth*.

SCUM is also used for the impurities which a liquor, by boiling, calts up to the surface; and also for those taken from off metals, when in fusion; these are also called *scoria*.

SCUM of Lead, is a kind of excrement, of various colours, procured from melted lead.

SCUM of Nitre. See **NITRE**.

SCUM of Salt. See **SALT**.

SCUM of Silver, is what we commonly call litharge of silver.

SCUM of Sugar, in *Agriculture*, a substance sometimes used as a manure. See **SUGAR SCUM**.

SCUM, Sugar of the. See **SUGAR**.

SCUMA, a word used by some of the chemists for *squama*, the scales of any metal, and particularly applied to the flakes flying off from hot iron under the hammer.

SCUOE, **SKUOE**, or *Skuve*, in *Geography*, one of the Faroer or Feroe islands; 5 miles S. of Sandoe. See **FEROE**.

SCUPI, in *Ancient Geography*, a town of Upper Mæsia, in Dardania, according to Ptolemy.

SCUPPERS, in a *Ship*, are certain channels cut through the water-ways and sides of a ship, at proper distances, and lined with plated lead, in order to carry the water off from the deck into the sea. The scuppers of the lower deck of a ship of war are usually furnished with a leathern pipe, called the *scupper-hose*, which hangs downward from the mouth or opening of the scupper. The intent of this is to prevent the water from entering, when the ship inclines under a weight of sail. Falconer.

SCUPPER Nails. See **NAILS**.

SCUR, in *Agriculture*, a precipice faced with rock.

SCURCOLLA, in *Geography*, a town of Naples, in Abruzzo Ultra; 18 miles S. of Aquila.

SCURELLUR, in *Ancient Geography*, a town of India, on this side of the Ganges, between the Pseudostome and the river Baris. Ptolemy.

SCURF, in *Medicine*, *Furfur*, small branny or powdery exfoliations of the cuticle, which occur after slight inflammations of the skin, a new cuticle being formed underneath during the exfoliation.

Scurf may be formed upon any part of the surface of the body; for wherever the skin is inflamed, the cuticle never fails to be separated and fall off. This exfoliation, when the inflammation is considerable, as in scarlatina, takes place in the form of large masses, or of smaller scales; but in the minor degrees of inflammation, such as of the formation of pimples, or in slight erythematous affections, a mere scurfiness ensues. In some cases of scurf, indeed, as in the dandriff of infants, and in other forms of pityriasis, little or no inflammation is perceptible; but in other cases, as in the scurfy porrigo, affecting the heads of adults, the inflammation is often considerable, and accompanied by severe itching. The scurf itself, indeed, if it be permitted to accumulate, becomes the source of excitement to the inflammation, as well as to the itching sensations.

The first step in the treatment of scurfy affections is, therefore, the careful removal of the scurf, as it is formed: but this must be effected by gentle means, and by washes which do not augment the inflammatory action, where that is considerable. Hence ablution with simple water, or some slight farinaceous decoction, as of bran, is to be preferred to soaps and other irritants. This clearance of the surface having been effected, some gently restraining lotion, such as lime-water, with or without a little of the liquor ammoniæ acetatis, or a weak solution of the salts of zinc, may be employed with advantage; or if the irritability of the parts be considerable, the saturnine substances may be preferable. See **PITYRIASIS**.

SCURFF, in *Ichthyology*, an English name for a species of salmon, called also in some places the *bull-trout*. It never grows to any great size, and differs plainly from the salmon of the common kind in this, that its tail is even, and not forked; its head is short and thick, and its flesh is less red than that of most of the salmon kind. See **TRUTTA** under the article **SALMO**.

SCURGULO, in *Geography*, a town of Naples, in Capitanata; 7 miles S.S.W. of Dragonera.

SCURGUM, in *Ancient Geography*, a town situated in the most northerly climate of Germany. Ptolemy.

SCURRA, in *Ornithology*, a name by which the ancients have called the *monedula*, or common jackdaw. See **CORVUS**.

SCURRIZANO, in *Geography*, a town of Naples, in Capitanata; 5 miles N.E. of Afcoli.

SCURVOGEL, in *Ornithology*, the name of an American bird, called by some the *whender-apoa*, and by the Brasilians *jibiriguaca*. See **MYCTERIA**.

SCURVY,

SCURVY.

SCURVY, in *Medicine*, *Scorbutus*, a formidable and often fatal disease, arising from imperfect nutrition, and other causes, and characterised principally by extreme depression of the vital powers, together with sponginess of the gums, ecchymoses, or purple blotches, on the skin, and spontaneous hæmorrhages. From its frequent occurrence in long voyages, it is sometimes called emphatically the *sea-scurvy*; but it is by no means peculiar to seamen, and was described as an endemic of the land by the earliest writers.

After having stated this brief character of the disease, it can scarcely be necessary to remark, that the term *scurvy* is most erroneously and absurdly used in popular language; being applied, in fact, to all *diseases of the skin*, of a slow and chronic nature, however various in their essential character, and possessing nothing in common with the true scurvy. The skin, in scurvy, indeed, is not the seat of the disease, but is only deranged, like other organs of the body, in the progress of the malady; and that derangement is totally different from the inflammatory, pimply, pustular, or scaly conditions of the skin, which occur in leprosy, tetter, and other cutaneous disorders, usually misnamed *scorbutic*. This mistake requires correction, not merely as a matter of nomenclature, but because a great practical error results from it; namely, the administration of *antiscorbutic* remedies in these cutaneous disorders, which cannot be cured, and are often aggravated, by them. The late Dr. Willan conferred a benefit on the profession, by his definite discrimination of these last-mentioned disorders. See **CUTANEOUS Diseases**.

The *scurvy*, properly so called, was first accurately described, and received its name, in modern times; and it is the subject of dispute, as in the case of some other diseases, whether it was known to the ancient physicians, or is a malady of more recent origin. The first specific accounts of the disease appeared in the early part of the sixteenth century, when the name of the malady seems to have been familiar among the vulgar: but the symptoms were noticed by the early voyagers in the preceding century; for considerably more than half the crew, who accompanied Vasco de Gama, in his voyage round the Cape of Good Hope, in the year 1497, were destroyed by this disease. Olaus Magnus, in his history of the northern nations, published in 1555, has described the disease at considerable length, and states that it was known to the inhabitants of Saxony by the name of *schorbuk*, or *scorbuc*; whence the Latin term *scorbutus*, and our appellation *scurvy*. The term signified *fore-mouth*, and was probably applied to the disease in consequence of the spongy ulcerations of the gums, with hæmorrhages, and loosening of the teeth, which are among the more severe symptoms of the complaint. Dr. Lind, however, suggests, with still more probability, that the name was derived from a Slavonic word, *scorb*, signifying *disease*; the scurvy being endemic in the northern countries of Europe, from whence we borrowed the appellation.

Most of the continental writers have maintained that, although the ancients have not described the symptoms of scurvy, as a single distinct disease, they have, however, mentioned several concurring symptoms, which can scarcely be supposed to belong to any other malady: while Drs. Freind, Lind, Trotter, and some other authors of this country, contend, that the Greeks, Romans, and Arabians, residing in southern climates, and unpractised in long voyages, probably never witnessed the scurvy, and thence have no where accurately described it. The rarity of the disease, under such circumstances, will probably account for the imperfect descriptions which they have left: but sieges and

seasons of great dearth were not uncommon in those times, and gave rise at least to the *ignis sacer*, which appears to have been nearly allied to scurvy; and the following observations relate to no other known disease.

Hippocrates, when describing the diseases of the spleen, mentions some symptoms which accompany the enlargement of that organ. "The colour of the body," he says, "is changed, and becomes black and pallid, like the rind of a pomegranate; the breath is fetid, and the gums also emit a bad smell, and fall away from the teeth; ulcerations break out in the legs, resembling *epinyctides*; the limbs are emaciated, and the bowels do not discharge their contents." (Lib. de internis Affect.) And again, in his second book of prognostics, Hippocrates observes, "In those who have tumid spleens, the gums are diseased, and the mouth emits a fetid odour; but those whose spleens are enlarged, without any consequent hæmorrhages, such persons are attacked with ill-conditioned ulcers in the legs, and black scars." Here we have an additional symptom of scurvy mentioned, *viz.* the hæmorrhages, which were omitted in the former description. Those, however, who expect to find only the utmost accuracy in the works of Hippocrates, will perhaps be surprised to find that he has again described, still more distinctly, the symptoms of scurvy, under another appellation. For in the same book (respecting internal diseases) in which he has noticed the enlarged spleens, he mentions the symptoms of the *ileus hæmatites* (ἱλεος αἱματιτις), or *bloody iliac disease*, in nearly the same terms. "This disease begins in the autumn, and exhibits the following symptoms. The mouth and teeth emit a fetid smell, and the gums separate from the latter, and blood flows from the nose; sometimes also ulcers break out in the legs, and while some of these heal, others break out afresh; and the skin about them is of a black colour, thin, and tender." This may be deemed a good brief description of scurvy; and if the commentators are right in their correction, the concluding symptom is equally characteristic: "the patient is indisposed to walk, or to use any exertion." The passage, as it stands in Hippocrates, however, asserts the affirmative, that the patient is disposed to exertion; a circumstance so inconsistent with ulcerations of the legs, hæmorrhages, and the other symptoms, that the commentators agree that the negative particle *ο* must have been omitted. Van Swieten remarks, that the epithet of *thin* or *tender-skinned* (λεπτοδερμοι), which Hippocrates applies to those patients, is particularly characteristic of the scorbutic state; since "we observe in the scurvy, that the slightest injuries break into the skin, and leave stubborn ulcerations in it; and this more remarkably happens in the legs, where only scratching them with the finger-nails will often raise an excoriation, that is followed by an ulcer of long continuance." (Comment. in Boerh. Aph. 1148.) Celsus, when treating of the affections of the spleen, mentions this indisposition of ulcers to heal: "Ulcera aut omnino non sanescunt, aut certe cicatricem vix recipiunt." And we may add, that the opinions of the commentators, respecting the sentence above mentioned, is confirmed by the statement of Celsus, who distinctly asserts, that exertion is painful and difficult. (De Medicinâ, lib. iv. cap. 9.) Paul of Ægina (lib. iii. cap. 49.), and Avicenna (lib. iii. fen. 15. tract. 2.), as well as other Greek and Arabian physicians, describe the same scorbutic symptoms as connected with tumid spleen. Modern observation has occasionally detected enlargement of the spleen in scorbutical cases, as in an instance related by Dr. Mead (Monita et Præcox. Med.): but such an enlargement is not always present, and it is probable that Hippocrates and the ancients, who saw the disease but seldom, had generalized too hastily from a limited

SCURVY.

limited experience, when they pronounced these symptoms as exclusively connected with enlarged spleen.

A disease is also mentioned by Strabo and Pliny, as occurring in the Roman armies in particular situations, which can only be referred to scurvy. In this disease, which Pliny ascribed to drinking the water of a certain well, when it occurred in the army of Germanicus while encamped near the Rhine, an affection of the gums, with a falling out of the teeth, is said to have been combined with a loss of muscular power in the lower extremities; the former affection being called *stomacace*, (quasi *στοματις κακια*, *oris vitium*;) and the latter *scletyrbe*. (Plin. Nat. Hist. lib. xxv. cap. 3.) Similar affections, to which the same appellations are given by Strabo, are said to have prevailed in the army of Ælius Gallus, when in Arabia. (Geograph. lib. xvi.) Some authors, however, have denied that this *scletyrbe* could be a scorbutic symptom; because Galen has stated *scletyrbe* to be a kind of paralysis, in which the patient is unable to walk straight: but such a term might be sufficiently appropriate to that rigidity of the joints, which often occurs in scurvy.

On the whole, therefore, we are disposed to believe, with the early writers upon this subject, that the *scurvy* was known to the Greek, Roman, and Arabian physicians; although, from its comparative rarity in southern climates, it did not occur so often, or so extensively, as to claim their attention very strongly. That it may occur in any climate where there is a dearth of fresh food, is very obvious; for it is found equally at sea and on the land, in Greenland or in the great South sea, in besieged towns, in frozen countries, and in ships, when fresh food is not to be obtained. Poupert has very correctly remarked, that the malignant scurvy of Paris bore a considerable resemblance to the pestilential *ignis sacer*, described by Lucretius (lib. vi.); an opinion which Dr. Lind, confounding this *ignis sacer* with the *plague* of Athens, described by Thucydides, considers as deserving no serious confutation. But the *ignis sacer* was extremely different from the *true plague*, as well as from the pestilence described by Thucydides (see *PLAGUE*); it seems to have been, like scurvy, the result of dearth, the *λοιμος μετα λιμον*, of which we hear so much in ancient history; it had several symptoms in common with scurvy, but was a febrile disease; and has been ascribed in modern times to diseases of corn, instead of the scarcity and deficiency of that nutriment. See *ERGOT*; *IGNIS SACER*; *KRIEBEL KRANKHEIT*; &c. For the observations of Poupert, see *Memoires de l'Acad. des Sciences*, an. 1699.

Symptoms of Scurvy.—The first indication of the approach of scurvy is an aversion to any sort of muscular exertion; a laziness, or strong inclination to sit still or lie in bed; which is accompanied with a spontaneous lassitude, or a sense of heaviness and pain throughout the body, and especially in the muscles of the limbs and loins, like that which arises from great fatigue, which soon becomes actual feebleness, so that the least exercise, especially in ascending or descending a declivity, induces fatigue and shortness of breath. With this aversion to motion and diminished power of exertion, there is also very early a change of the complexion, which becomes pale and bloated, or fallow, especially about the lips and corners of the eyes, where there is a greenish tinge. These two symptoms, indeed, the disinclination to exertion, and the fallow countenance, often portend the approach of scurvy, while the patient eats and drinks heartily, and seems otherwise in good health: and the speedy lassitude and difficulty of breathing upon motion, are among the most constant concomitants of the distemper throughout its course.

As the disease advances, other symptoms appear. Among

these the *stomacace*, or morbid condition of the mouth, is one of the first that presents itself. The gums become hot and painful, and soon swell, growing soft and spongy, and of a livid hue, and afterwards extremely putrid and fungous, constituting one of the most distinguishing features of the disease. This occasions great fetor of the breath, and the loosening of the teeth, which become moveable in their sockets, and may be taken out without force or pain, and even fall out spontaneously. Hæmorrhages also take place from the slightest pressure on the gums, or even without any apparent cause, as well as from the nose; and ultimately from other parts of the body, where the cuticle is delicate, or the surface broken, in consequence of the apparent loss of cohesion in the solids, and especially in the vascular system.

From this cause the *skin* also exhibits some of the most striking characteristics of scurvy. It becomes dry, and spotted over with discolourations of a red, blueish, purple, and black hue, of various sizes, from the *petechie*, or spots like flea-bites, to the most extensive *ecchymoses*, of the size of a hand-breadth, or larger, such as are produced by the severest bruises. These appear chiefly on the legs and thighs; but often also on the arms, breast, and trunk of the body; and sometimes, though more rarely, on the head and face. They consist, in fact, of effusions of blood under the cuticle, from the rupture of the small vessels. As the disease advances, this laxity and loss of cohesion in all the solids becomes still more manifest, by the frequent and profuse bleedings which are liable to occur from different parts of the body; especially from the nose, gums, stomach, bowels, lungs, kidneys, and bladder, and from the ulcers and fungous excrescences which arise on the surface. In some patients, the hæmorrhages from the bowels are accompanied by severe pains and diarrhœa; while others, without either a purging or gripes, discharge great quantities of pure blood by the anus. Other marks of laxity appear in the œdematous swelling which takes place in the legs, beginning first about the feet and ankles; which, however, is more painful than common anasarca, and retain longer the impression of the finger. They appear remarkably also, in the great facility with which the slightest bruises and wounds degenerate into foul fungous ulcers, as well as in the spontaneous appearance of such ulcers, and the breaking out of long-healed sores, and even the disunion of old fractures in bones. "Whatever former complaints," Dr. Lind observes, "the patient has had, especially bruises, wounds, &c.; or whatever present disorders he labours under, upon being afflicted with the scurvy, his old complaints are renewed, and his present rendered worse." Indeed the scurvy often first shews itself by the changes in diseased parts. "Thus, when a person has had a preceding fever, or a tedious sickness, by which he has been much exhausted, the gums for the most part are first affected, and a lassitude constantly attends; whereas, when one has been confined from exercise by having a fractured bone, or from a bruise or hurt, these weak and debilitated parts become almost always first scorbutic. As for example, if a patient labours under a strain of the ankle, the leg, by becoming swelled and painful, and soon after covered with livid spots, gives the first indication of the disease. And as old ulcers on the legs are very frequent among seamen, in this case likewise the legs are always first affected, and these ulcers put on a scorbutic appearance, although the patient seems otherwise perfectly healthy, and preserves a fresh good colour in his face." (Lind.) The effect of the disease upon former maladies is strongly depicted by the elegant writer of Lord Anson's voyage. "But a most extraordinary circumstance," says that gentleman, "and

SCURVY.

"and what would be scarcely credible upon any single evidence, is, that the scars of wounds which had been for many years healed, were forced open again by this virulent distemper. Of this there was a remarkable instance in one of the invalids on board the Centurion, who had been wounded above fifty years before at the battle of the Boyne; for though he was cured soon after, and had continued well for a great number of years past, yet on his being attacked by the scurvy, his wounds, in the progress of his disease, broke out afresh, and appeared as if they had never been healed. Nay, what is still more astonishing, the callus of a broken bone, which had been completely formed for a long time, was found to be hereby dissolved, and the fracture seemed as if it had never been consolidated." (A Voyage round the World in 1740—4, by Lord Anson, compiled by the Rev. R. Walter, chaplain to the Centurion, p. 102.) The ulcers, which occurred in the legs of the scorbutic patients on this occasion, are said to have been "of the worst kind, attended with rotten bones, and such a luxuriance of fungous flesh, as yielded to no remedy." The edges of these scorbutic ulcers are of a livid colour, and puffed up with the fungous excrescences, which are not inaptly called by the sailors, *bullock's liver*, since to this substance, when boiled, Dr. Lind says, they bear a near resemblance, both in consistence and colour. They often arise in the course of a night to a monstrous size, and although destroyed by caustics, or the knife, (in which last case, a copious bleeding commonly ensues,) are found at the next dressing as large as ever. Dr. Lind affirms, however, that "they continue in this condition a considerable time without tainting the bone." (Lind on Scurvy, pt. ii. ch. 2.) These scorbutic ulcers, which are singular and uniform in their character, are distinguished from all others by being so remarkably offensive, bloody, and fungous.

In addition to these affections of the lower extremities, (to which however they are not exclusively confined,) in the advanced stage of the scurvy, "the patients most commonly lose the use of their limbs, having a contraction of the tendons in the ham, with a swelling and pain in the joint of the knee. Indeed, a stiffness in these tendons, and a weakness of the knees, appear pretty early in this disease, generally terminating in a contracted and swelled joint." (Lind, loc. cit.) We have given this description in the words of Dr. Lind, in order to shew how distinctly it answers to the account of the *scletyrbe*, occurring in the Roman armies, in conjunction with the *stomace*.

In the progress of the scurvy, the patients commonly complain of pains, which are often moving from part to part. Some complain of a general pain in their bones, which is most violent in the limbs and loins, and especially in their joints and legs; and a pain, with tightness and oppression in the breast, is very common. The head is seldom or never affected, unless the patient is feverish, which is unusual; for, as Dr. Lind well observes, the disease is altogether of a chronic nature, and fever may be justly reckoned among its adventitious symptoms. It is remarkable, indeed, that in the worst stages of the scurvy, with all the severe symptoms above described, with painful spreading ulcers of the surface, with contracted limbs, hæmorrhages, spongy, putrid, stinking gums, over-run with sprouting flesh, and often deeply ulcerated, with inability to make the least muscular exertion, without fainting or perhaps dying; yet the patients, even in this stage, have a good appetite, with their senses entire, and, though easily dejected and made low-spirited, yet, when in bed, they make no complaint of pain or sickness, and appear to be in tolerable health. This singular characteristic of the disease is well depicted by the

reverend author before quoted. "Indeed, the effects of this disease," he says, "were in almost every instance wonderful; for many of our people, though confined to their hammocks, appeared to have no inconsiderable share of health; for they eat and drank heartily, were cheerful, and talked with much seeming vigour, and with a loud strong tone of voice; and yet on their being the least moved, though it was only from one part of the ship to the other, and that in their hammocks, they have immediately expired; and others, who have confided in their seeming strength, and have resolved to get out of their hammocks, have died before they could well reach the deck. And it was no uncommon thing for those who were able to walk the deck, and to do some kind of duty, to drop down dead in an instant, on any endeavours to act with their utmost vigour; many of our people having perished in this manner during the course of this voyage." Lord Anson's Voyage, loc. cit.

Few of the authors, who have described the disease, have been very industrious in the examination of the bodies of those who have died. The most ample account of the dissections of scorbutic patients has been given by M. Poupert, in his account of the disease, as observed at the hospital of St. Louis at Paris. The principal phenomena described by him were the results of the general extravasation of blood, and of the dissolution and separation of parts naturally united. Thus the bodies of the muscles were often found swelled and hard, from the blood fixed among their fibres, so that the limbs remained bent or contracted; and the epiphyses of the bones were found separated, the cartilages of the sternum were loosened from their union with the bony part of the ribs, and the ligaments of the joints were corroded and loose. He adds, that the mesenteric glands were generally obstructed and enlarged, and the spleen three times bigger than natural, and fell to pieces as if it consisted of coagulated blood.

Causes of Scurvy.—The predisposing causes of scurvy, or those circumstances which produce a predisposition to the complaint, are various. Preceding diseases, whether of the acute or chronic kind, render persons more liable to the scurvy, where the exciting causes exist: and inactivity and indolence greatly facilitate the attack of the malady. Those who are recovering from fevers, or who have been weakened by long attacks or relapses, most readily fall into scurvy; and the marines on ship-board, who have less work, commonly suffer in a much larger proportion than the sailors. On the other hand, however, excessive fatigue and over-exertion, which exhaust the strength, as well as want of sleep, contribute to accelerate the attack of scurvy. An attention to this point was one of the most effectual means employed by captain Cook for the prevention of scurvy among his crews, as well as the avoiding of cold and moisture, from which much predisposition to the disease arises. A state of despondency and gloominess of mind contributes also materially to invite and aggravate the scurvy: it attacks the discontented and repining, while persons of more cheerful dispositions escape. Hence perhaps newly-impressed seamen are found to be particularly liable to it; and the inhabitants of besieged towns are observed to be very susceptible of its impressions.

The principal exciting cause of scurvy appears to be the use of a *certain kind of diet*; and it is probable that every species of diet, which, either from being difficult of digestion, or from containing but little nutriment, fails to nourish the body, is capable of producing the disease under certain circumstances: we say, it is probable; for we shall have occasion to shew hereafter, that this notion is not entirely consistent with all the facts, and is somewhat inconsistent especially

SCURVY.

especially with the nature of the remedies. As the disease is most frequently occasioned in modern times by a *sea diet*, it has been ascribed to the use of *salted* meats; but this opinion is altogether erroneous, and has been amply refuted by Drs. Lind, Milman, and others. It has occurred, indeed, to a great extent, where salted meats were not used; but it has been equally prevalent where the diet consisted principally of farinaceous or other unfermented vegetable matters, such as hard biscuits, peas, and beans, or of smoke-dried fish or flesh, cheese, &c. In some experiments, made by Dr. Stark in his own person, relative to the effects of particular articles of diet, symptoms of scurvy were induced by living a short time exclusively upon sugar. (See Stark's whole works, 4to. Lond. 1788.) And in the Russian armies, at the siege of Afoph, in 1736, and subsequently in their march to Oczakow, the scurvy prevailed to a great extent, although their diet did not consist of salt-provisions. They had little fuel to enable them to dress their victuals, and the fat indigestible fish of the river Don, being half-cooked, and their bread ill-baked, produced frequent sicknesses, and ultimately the scurvy. (See Dr. Nitzsch's account of this disease in the Russian armies, quoted by Dr. Lind.) The same calamity occurred in the imperial army in Hungary, about the same period, although the army had fresh beef in plenty; but their other food consisted of a gross and viscid bread, or other farinaceous matters, and especially of a sort of glutinous pudding, called *rollatschen*, which was principally eaten by the Bohemians, who were indeed almost the only people who suffered from the scurvy. (See Geo. Hen. Kramer. Diss. epistolica de Scorbuto; which contains the case of the imperial troops, addressed to the college of physicians at Vienna.) There is no doubt, therefore, if we examine the history of the malady, that persons predisposed to it, if they live upon any species of indigestible food, whether it be of an animal or vegetable nature,—whether preserved with salt, or not at all impregnated with it,—will be equally attacked with scurvy; and those persons are observed to suffer the most, who make the freest use of these indigestible substances. In all these instances, however, *fresh* vegetable substances did not probably constitute any considerable portion of the diet.

Other exciting causes, however, must co-operate with this diet to produce the scurvy, especially in its severe degrees. And hence whatever contributes to impair the health, and depress the mind, during the use of such food, materially accelerates the occurrence of scurvy; and we have already stated the effects of indolence, over-fatigue, and the depressing passions, in predisposing the constitution to take on this disease. Indolence and inactivity conduce to excite the scurvy, because the hard and indigestible diet just alluded to requires a certain degree of exercise to subdue it in the stomach. The influence of exertion was curiously exemplified in the cases of those persons who have wintered in high northern latitudes. The scurvy was the source of fatality which they had to dread: and it is singular, that those who went prepared to spend the winter in these frozen climates, and supplied with provisions, clothing, fuel, &c. have uniformly died of the scurvy; while those who have been accidentally left, without any provision, have escaped that disease and enjoyed good health. In 1633 two trials were made by the Dutch of establishing wintering-places at Spitzbergen and on the coast of Greenland, in latitude about 77° or 78°. Seven sailors were left at each, amply furnished with every article of clothing, provision, and utensils, thought necessary or useful in such a situation. The journals of both companies are preserved. The men at Greenland began to make a constant fire to sit by in October, served out their

allowance of brandy, and now and then killed a bear: but in March they were all very ill of the scurvy; and on April sixteenth the first man died, and all the rest were entirely disabled, except one person. This poor wretch continues the journal to the last day of April, when they were praying for a speedy release from their miseries. They were all found dead. The men left at Spitzbergen killed but one fox the whole time. The scurvy appeared among them so early as November twenty-fourth, and the first man died January fourteenth: the journal ends February twenty-sixth; and these too were all found dead. Accident, however, soon afterwards gave rise to an experiment which had a very different result. For on the same side of Spitzbergen, and in nearly the same latitude, a boat's crew, consisting of eight Englishmen, who had been sent ashore to kill deer, were by some mistake left behind, and reduced to the deplorable necessity of wintering in that dreadful country, totally unprovided with any of the necessaries. Taking advantage of a large substantial wooden building, erected for the use of the coopers belonging to the fishery, they rendered it warm and comfortable by building a smaller one within it, and by deer-skin beds, &c. They were tolerably supplied with fuel from old casks and boats, which they broke up, and, before the cold weather set in, they laid in a considerable stock of venison, having killed a good number of deer, the greater part of which they roasted, and stowed in barrels, reserving some raw, which became frozen. This venison, with a few sea-horses and bears which they killed from time to time, constituted their whole winter's provision, except a very unfavourable article, which they were obliged to make out with, at first two and afterwards four days in the week, which was whale's fritters, or the scraps of fat after the oil has been pressed out. Their only drink during the whole time was running water, procured from beneath the ice on the beach, till January; and afterwards snow-water melted by hot irons. The melancholy of their situation was aggravated by the absence of the sun from the horizon, from October fourteenth to February third, of which period twenty days were passed in total darkness. They contrived, however, to keep their fire and lamps continually burning during this period. At the approach of spring, they had the good fortune to kill several white bears which proved excellent food; and these, together with wild fowl and foxes which they caught, enabled them to dispense with their fasting days on the mouldy fritters, and soon improved their vigour. Upon this simple fare, without spirits or fermented liquors, they were able to pass this rigorous winter; unaffected by scurvy or any other disease: at the return of the ships on May twenty-fifth, they all appear to have been in health; and all returned in safety to their native country. (See Mem. of the Liter. and Philos. Society of Manchester, vol. i. p. 89, et seq.) Another still more striking illustration is related by Dr. Aikin, in the paper just referred to, in the case of four Russians, who were left at Spitzbergen, and also found a hut in which they resided above six years, living on the bears, deer, and foxes, which they caught, and drinking the running water in summer, and melted ice in winter. Three of them remained entirely free from the scurvy during the whole of their abode; but the fourth died of it, after lingering to the sixth year. This person, it is remarked, was of an indolent disposition, and could not conquer his aversion to drinking the rein-deer's blood. The continual exercise, required by the hunting of these animals, appears to have been the great source of health, and to have kept at a distance the scurvy, which is endemic in Lapland, Norway, Sweden, Russia, and in latitudes much less northerly than Greenland.

Other circumstances, both on ship-board and on land, by impairing the general vigour of the constitution, conspire to produce the scurvy. Thus it was observed to be endemic at particular places in Holland, while others, where the same diet was used, remained entirely free from it. Ronssiaus, a very able and accurate writer on the subject, remarks, that it was much more frequent in his time at Amsterdam and Alcmær, than at Goude and Rotterdam; and at Dort was hardly ever to be seen. He observed, indeed, that universally in all parts of the country, where the soil was fenny and damp, it raged with the greatest violence; and that the weather had great influence upon it, southerly winds, if long continued, multiplying the disease, and rainy seasons rendering it quite epidemic and malignant. The changes that have taken place in the condition of the land, and in the mode of living, since the wealth of Holland has increased, have rendered the disease much less frequent, and have confined it almost exclusively to the poor, who inhabit the low damp parts of the provinces, and continue to live upon dried meat and coarse bread, and to drink unwholesome stagnant water.

The effect of certain depressing passions, not only in predisposing to the scurvy, but in exciting and aggravating it, has been strongly manifested. Vander Mye exhibits a curious and diversified picture of the operations of the passions of the mind during the famous siege of Breda, when the scurvy committed great havoc in that town. Upon the report of bad news, it always spread astonishingly: but it was in a manner altogether checked by the arrival of agreeable intelligence. And the writer of lord Anson's voyage observes, "it was most remarkable in all our reiterated experience of this malady, that whatever discouraged our people, or at any time damped their hopes, never failed to add new vigour to the distemper; for it usually killed those who were in the last stages of it, and confined those to their hammocks, who were before capable of some kind of duty; so that it seemed as if alacrity of mind and sanguine thoughts were no contemptible preservatives from its fatal malignity."

On the Prevention and Cure of Scurvy.—It is customary in medical discussions, after stating the symptoms and causes of any disease, to proceed to point out the essential nature, or proximate cause, as it is technically termed, of the malady, before treating of the method of cure, which should generally be deduced from the consideration of the whole of these circumstances taken together. In this case, however, we can scarcely discuss the nature of the proximate cause, without a previous knowledge of the means by which the malady is prevented or removed; since these means tend to elucidate the nature of the symptoms which they remedy. We shall, therefore, first detail the means of prevention and cure.

The prevention of scurvy will consist chiefly in removing or counteracting the predisposing and exciting causes, which have already been enumerated. Much is done, therefore, by preserving a due degree of general health in the individuals exposed to the exciting causes; and especially by avoiding cold and moisture, by means of proper clothing, warm cabins, &c.; and by avoiding indolence and inactivity on the one hand, and over-fatigue, watching, &c. on the other. The effects of the former are exemplified in the comparative exemption of even the petty officers in a ship of war, while the crew suffer severely. "The Channel fleet," says Dr. Milman, "has often buried a hundred men in a cruise, and landed a thousand more afflicted with scurvy, and yet among these there has not been a petty officer. How does the condition of the petty officer differ

from that of the common sailor? The one as well as the other is obliged to live on the ship's provisions. The only difference is, that the petty officers sleep in close births, as they are called, with canvas hung round, by which they are sheltered from the inclemencies of the weather. Besides the advantage of warm cabins, they are more warmly clad, and having a greater plenty of clothes to shift, they are less liable to continue wet, or to be so unclean as the common men." (Milman on Scurvy, p. 31.) But the security from scurvy, obtained by attention to these points of general health, was most strikingly manifested in the judicious management of captain Cook, by which he was enabled to repeat the voyage, in which the scurvy had proved so fatal to lord Anson's crew, without losing any men by that disease. The great navigator studied and enforced the rules of general health with great assiduity, and his success was complete. He was especially careful to guard against the too great fatigue of his men, and to secure them as much as possible from the effects of cold and moisture. In the first place, he divided them into three watches instead of two, (except upon some extraordinary occasions,) by which means they had eight hours rest for four of duty, and did not get the broken sleep, which men in their situations have generally obtained. They had thus time to recruit their strength before they were summoned to return to their labour, and they were likewise thus less exposed to the weather, than if they had been at watch and watch. If the men got wet, they had generally dry clothes provided to shift themselves. Proper methods were taken to keep the ships clean, and dry between decks. The hammocks and bedding, every day that was fair, were not only ordered upon deck, but each bundle was unlashed, and so spread out, that every part might be exposed to the air. Besides the ordinary methods of washing and scraping the decks, captain Cook had some wood put into a proper stove, kindled, and carried successively to every part below deck; which not only contributed to dry the ship, but by heating the impure air below, and rendering it specifically lighter than the common air, to make it rise and pass through the hatchways into the atmosphere. In the torrid zone, he shaded his people from the scorching sun, by an awning over his deck; while in his course under the antarctic circle, he had a coat provided of a substantial woollen stuff, with the addition of a hood to cover their heads. The Russian boor, Dr. Milman remarks, seems to be greatly indebted to similar means for his preservation from the scurvy: for, though he lives in an extremely cold climate, eats a good deal of salted meats, has no fresh vegetables for six months of the year, and breathes during that time the foul air of an unventilated apartment; yet, clothing himself in warm flannels, covering himself at night with warm sheep-skins, providing for his cleanliness with the regular use of the warm bath, he is seldom afflicted with this calamity.

Captain Cook also attended to the nutriment of his men. Hard and salted meats require assistance in their solution and digestion in the stomach, and a plentiful supply of water was always carefully provided by him. Salt-water, indeed, may be rendered sweet by distillation, which deprives it of its saline parts, and may be made more palatable by impregnation with carbonic acid gas, or with robs and acid juices. This method, however, was not known to captain Cook. In attending to the diet of his men, he would not suffer the fat, which is boiled out of salt beef and pork, to be given to his men, as is customary. It did not escape that sagacious officer's notice, that such gross indigestible matters had a great tendency to excite scurvy.

SCURVY.

Thus, then, by an attention to cleanliness and ventilation, by guarding against fatigue, cold, heat, wet, &c. and by providing at all times plenty of fresh water, captain Cook's seamen lived with impunity on their salt provisions. And a similar instance is mentioned by Dr. Trotter, in the case of the *Intrepid*, a ship of sixty-four guns, with a complement of five hundred men, in lord Rodney's fleet, which did not lose a man, except from wounds, for the space of two years and a half. "This ship was in a very sickly state when captain Molloy took the command of her; but by the complete mode of discipline, and attention to the cleanliness of the crew and ship, which he established, health was preserved in a climate reputed to be unwholesome; and that too, when exposed to the hardships which follow a state of frequent or constant preparation for action." (Trotter on the Scurvy.) Even where the exciting causes exist, therefore, the scurvy may be prevented by extraordinary and continued discipline in the care of the general health.

Something still further, however, has been attempted, in the way of prevention, by diminishing the extent of the chief exciting cause; although it may be questioned, whether much has been effected in this way. The Dutch were supposed to have preserved their seamen from scurvy by the use of *four krouit* with their salt provisions, and this article was recommended to the British navy by Dr. Lind: but it is prepared by a sort of fermentation, which produces the acidity; and this sort of acetous acid, the product of fermentation, does not appear to be a substitute for the acid of fresh vegetables. Dr. Trotter, however, is of opinion, that the virtues of this substance as an antiscorbutic are very trifling, and that it has cost the government in its preparation more than it is worth. Another substance has also been employed in the British fleet, as a substitute for fresh vegetables in preventing scurvy, on the recommendation of Dr. McBride, viz. the *essence* or *extract* of malt. It was recommended upon the hypothetical notion, that it contained much of the cementing principle, as he called it, or that principle which, when present in animal and vegetable substances, prevents the process of putrefaction; and that by restoring this principle to the blood, the diseases, which arise, like scurvy, from a putrid diathesis, (thus heaping hypothesis upon hypothesis,) would be prevented and cured. The truth, however, is, that there is little or no carbonic acid in this substance; and the favourable accounts received at the admiralty of its beneficial effects, which induced them to establish the use of essence of wort as a part of naval victualling, are to be ascribed rather to its being a wholesome, nutritious, and digestible substance, consisting principally of vegetable mucilage with some sugar, than to any specific antiscorbutic properties. This appears to be the opinion of Dr. Trotter, and Dr. Lind speaks of it only as "a very *nourishing* liquor, well adapted for scorbutic patients." It does not appear, however, that these articles are sufficient substitutes for fresh vegetable productions; and they certainly do not possess the same powers, with the latter, of curing the scurvy, when it already exists. With the proper acids, which have been generally adopted since the time of captain Cook, they contribute to the support of the general health, and therefore to the prevention of scurvy.

There is another species of vegetable matter, however, which appears in some measure to supply the particular substance, which fresh vegetables afford, and which is used both as a preventive and a cure for the scurvy, namely, the acid of limes, lemons, and other similar fruits, which the art of chemistry has for some time supplied in a concrete

state. These substances, we believe, are now considered as among the necessities for a long voyage, and are probably much more efficient than the four krouit, essence of malt, &c.

Cure of Scurvy.—When the preventive measures have been neglected, or ineffectually employed, and the disease has already appeared, it is very difficult to remove it, while the circumstances of diet, &c. remain unchanged. Where these circumstances, however, admit of a change, experience has shewn that the cure is very simple, and often very expeditious. A pure, dry, warm air, with the use of *fresh vegetables*, almost of any sort, commonly proves effectual. The instinctive feelings of the sick, indeed, direct them strongly to the use of the chief remedy; for there is perhaps no desire so intense as that which the scorbutic patient feels for the use of green vegetables, fruits, and acids; inasmuch that the sailors of lord Anson's ships greedily devoured the *grass*, which was the first vegetable matter obtained. The vegetables and fruits which contain the greatest proportion of acid, are the most effectual remedies for the symptoms of sea-scurvy; whence sorrel and such like plants, but above all limes, lemons, oranges, apples, currants, &c. act in a manner as *specifics* in relieving the disease. All succulent vegetables, and those especially which are of an aromatic nature, are useful, particularly when combined with the acid ones; whence scurvy-grass, horse-radish, cress, purslane, and the tetradynamia, are ranked among the antiscorbutics, and numerous plants have been specified by different writers as possessed of special virtues. On the whole, however, the acid juices appear to be most speedy and effectual remedies for scurvy, especially those which approach to the nature of the citric acid.

The testimonies in favour of the *specific* curative powers of these acids in scurvy are so numerous as to leave no doubt of the fact. Even Dr. Lind, with whose hypothesis respecting the nature of the disease the fact was not quite compatible, admits, in his postscript, their striking efficacy. "To what has been already said," he observes, "of the virtues of oranges and lemons in this disease, I have now to add, that in seemingly the most desperate cases, the most quick and sensible relief was obtained from lemon-juice; by which I have relieved many hundred patients, labouring under almost intolerable pain and affliction from this disease, when no other remedy seemed to avail." As the acid is apt to operate violently upon the stomach and bowels of those who are much weakened, Dr. Lind recommends the addition of wine and sugar, as constituting the best antiscorbutic, and was in the practice of ordering about four ounces and a half of lime or lemon-juice, and two ounces of sugar, to be put into a pint of Malaga wine, which was sufficient for any weak patient to take in twenty-four hours.

Dr. Trotter testifies the extraordinary cure of these scorbutic symptoms by the use of these acids, even though at the same time they produce a very lax or purging state of the bowels; and some degree of emaciation; while, on the other hand, the use of fresh animal food, strong broths, and wine, produces comparatively very little benefit upon scorbutic persons, although debility is the most marked symptom of the disease. This diet and the Peruvian bark will often produce no favourable change upon scorbutic ulcers, and the most powerful stimulant applications will not alter the condition of these sores: yet in less than twenty-four hours after the use of lemon-juice, the livid complexion of the sores, with the black clot of blood on their surface, will often disappear, and they will put on a florid and healthy character. The farther effects of the lemon acid are thus described by Dr. Trotter. "The patient in the inveterate stage of the disease seems to gather strength even from the
fight

fight of the fruit; the spirits are exhilarated by the taste itself; and the juice is swallowed with emotions of the most voluptuous luxury. The gums are gradually hardened, and the teeth fixed in their sockets. The dull eye and bloated looks in a few days put on the clear healthy complexion, which also extends to the whole surface of the body. The absorption of the effused blood in different parts goes on rapidly, and by marking the spots, you may calculate the progress of the absorption, and the cure of the disease. This absorption bespeaks a degree of stimulus communicated to the lymphatic system as well as the sanguiferous, as soon as the blood has received a sufficient quantity of the vivifying principle. From the effects of the juice upon the bile, the colour of the stools is changed, and a lax state of the bowels is the consequence. But it is to be observed, that this laxity of the intestines may be moderated by giving the fruit in smaller quantities: a speedy cure, however, demands that they should be given *ad libitum*, and the greater the number of lemons taken in a day, the recovery will be more rapid in proportion. Loc. cit. p. 142.

While, on the one hand, these fresh vegetables and vegetable acids speedily remove the symptoms of scurvy, experience has fully ascertained, on the other, that the medicines called tonics, such as the mineral acids, steel, Peruvian bark, and the various vegetable bitters, which have also been considered as antiseptics, or antidotes of putrefaction, are incapable of affording any effectual relief. And wine, which has been found a valuable remedy in some low fevers, gives but a momentary stimulus; but it does not retard the disease, nor afford any permanent relief alone. It was clearly proved, too, in lord Anson's fleet and elsewhere, that abundance of fresh provisions of animal substances and fish, even with plenty of fresh water, did not tend to arrest the progress of the disease. The use of mercury appears to be injurious under every stage of the scurvy.

In speaking of the predisposing causes of scurvy, we have mentioned the effect of the depressing passions in inducing and aggravating the disease; and we have now to mention, on the other hand, the remarkable effects of hope, and the exciting passions, in aiding the cure of the disease. The following striking example of this medicine of the mind is related by Vander Mye, in his account of the disease, when it occurred during the siege of Breda, spreading despair and death around. "On the 2d of May, 1625, when the prince of Orange heard of their distress, and understood that the city was in danger of being delivered up to the enemy by the soldiers, he wrote letters addressed to the men, promising them the most speedy relief. These were accompanied with medicines against the scurvy, said to be of great price, but of still greater efficacy: many more were yet to be sent. The effects of this deceit were truly astonishing! Three small phials of medicine were given to each physician, not enough for the recovery of two patients. It was publicly given out, that three or four drops were sufficient to impart a healing virtue to a gallon of liquor. We now displayed our wonder-working balsams. Nor were even the commanders let into the secret of the cheat put upon the soldiers. They flocked in crowds about us, every one soliciting that part might be reserved for their use. Cheerfulness again appears on every countenance; and an universal faith prevails in the sovereign virtues of the remedy. The herbs now began to spring up above the ground; we of these made decoctions, to which wormwood and camphor were added, that by their prevalent flavour the medicines might appear of no mean efficacy. The stiff contracted limbs were anointed with wax melted in rape-seed or linseed oil. The invention of new and untried physic is boasted; and amidst a defect of

every necessary and useful medicine, a strange medley of drugs was compounded. The effect, however, of the delusion was really astonishing: for many were quickly and perfectly recovered. Such as had not moved their limbs for a month before, were seen walking the streets sound, upright, and in perfect health. They boasted of their cure by the prince's remedy: the motion of their joints being restored by a simple friction with oil, nature now of itself well performing its office, or at least with a small assistance from medicine. Many who declared that they had been rendered worse by all former remedies which had been administered, recovered in a few days, to their inexpressible joy, and the no less general surprise, by the taking (almost by their having brought to them) what we affirmed to be their gracious prince's cure." This account of the curative influence of the passions is fully sanctioned by the statement in lord Anson's voyage, already quoted, and by a fact mentioned by Mr. Ives, in his journal. On the 30th of January, 1744, there were nearly seventy persons ill of scurvy in the Mediterranean fleet; yet the joy of approaching the enemy's fleet, and the hope of beating them, had such an effect, that on the 11th of February following, when the engagement happened, there were not above five men not at their fighting quarters.

Many remedies have been mentioned by different writers, who have treated of scurvy, and many local applications and methods of curing particular urgent symptoms, such as hæmorrhages, spongy gums, ulcerations, diarrhœa, stiffness of the tendons, &c. have been detailed; but it is unnecessary to repeat them; since the only effectual mode of alleviating particular symptoms is the radical cure of the constitutional disease. "Fomentations, the warm-baths, &c." Dr. Trotter observes, "have been often tried for the rigid tendons, and hardness of the muscles, but without effect: stimulant applications have been equally unsuccessful. For the difficult breathing and tightness about the breast, blisters and the whole train of expectorants are insufficient to relieve them. Opium itself, our last and only refuge in other cases of acute pain, affords no refreshing sleep or ease to the scorbutic sufferer. We have heard much of sudorifics opening the pores of the skin and softening the surface; but this is trifling with the complaint. It is only the produce of fresh vegetation, that can administer to him the reviving cordial; and a few lemons will do more to alluage his anguish than the whole art of pharmacy." P. 231.

On the Nature of Scurvy.—Various hypotheses have been framed at different times, according to the prevalent pathological doctrines, to account for the phenomena of this singular and formidable disease; and like most other medical hypotheses, they have hinged chiefly upon two principles, by one of which they are referred to certain morbid conditions of the blood or circulating fluids, and by the other to morbid changes in the property of the living solids. If we take into consideration, however, the whole phenomena of the disease, its causes, and remedies, we shall find considerable difficulty in admitting either of these hypotheses exclusively, and not a little in giving any satisfactory view of the subject, even by allowing the partial truth of both.

All the older writers, being of the humoral school, maintained the doctrine of a morbid state of the fluids, as the proximate cause of scurvy. Boerhaave and his adherents referred the disease to an acrimony of the fluids, which they supposed would be of a different quality, according to the different causes which produced it; thus it would be an alkaline acrimony from salt and putrid provisions and foul water,

SCURVY.

water, and an acid acrimony from bad sorts of bread or vegetable gluten, combined with a sedentary life. (See Boerhaave, Aph. 1153.) Dr. Cullen, too, though he relinquished much of the humoral pathology, was of opinion that scurvy was the effect of "a preternaturally saline, and consequently dissolved state of the blood," which was occasioned by a greater advance towards putrefaction, from the absence of the corrective of vegetable matters. (See First Lines, par. 1812—13.) And sir John Pringle maintained a similar doctrine, that scurvy was the result of "a gradually accumulating putrefaction" in the blood, from the putrescency of salted food, which he deemed the chief cause of the disease. (See his Obf. on Dis. of the Army, Appendix, p. xci.) In fact, the general opinion, for a long period, deemed scurvy the most characteristic example of a putrid disease. And this putridity of the fluids was inferred from the fetor of the breath, and of the ulcers; from the black colour and loose consistence of the blood; from the extensive hæmorrhages; from the purple blotches on the skin, &c. But this is a gratuitous and erroneous inference: for we have no less authority than that of Dr. Lind, who made numerous experiments on the subject, for asserting that blood, drawn from scorbutic patients, even in a dying state, discovers no sensible test of either acrimony or putridity, by the taste or the smell; that the serum of such blood is as tasteless as the white of an egg, and without odour; that it corrupts in the air no sooner than the blood of healthy persons; and that thin slices of mutton, immersed in this serum, continued sweet and free from taint, as long as in the serum of persons in health. We know, indeed, from actual experiments, that if the smallest quantity of putrid matter be injected into the blood-vessels, it is followed by speedy death. (See a Diss. by Dr. Scybert, on the Putrefaction of the Blood, Philadelphia, 1793.) The ordinary secretions from the blood are not putrescent, as has been asserted. Dr. Lind affirms, "the urine in this disease was not found to be more offensive to the smell, nor to corrupt sooner, than that of a person in health; and their sweat is not fetid, or more disagreeable than when they are in health: the same may be said of their stools." (Postscript, p. 515.) The same experienced physician justly observes, "the offensive smell from the mouth of scorbutic persons, when alive, seems to me to proceed solely from the corrupt state of the gums. For in their dead bodies I never perceived any unusual marks of putrefaction; they were neither more offensive, nor liable to corrupt sooner, than any other corpse." In a word, the notion of a putridity of the circulating blood is not only unsupported by actual evidence, but is refuted by all sober fact and observation; and these experiments of Dr. Lind prove that there is not even a proneness to putridity existing in either solids or fluids.

Can we account, then, for the phenomena of scurvy upon the other hypothesis, which ascribes the malady to certain morbid conditions of the living solid? This view of the subject was ably advocated by doctor, now sir Francis Milman, in one of the most elegant medical essays in the English language, published in the year 1782, (Enquiry into the Source of the Symptoms of Scurvy and Putrid Fevers, &c.); and, in fact, it affords the most rational explanation of most of the symptoms of the disease, according to the physiological and pathological doctrines which modern inquiries have established. It is not at present, therefore, necessary for us to enter into any minute detail of the symptoms, with the view of explaining them upon the principle of a weakened and impaired condition of the nervous system, and of the muscular irritability. This has been

accomplished at great length by Dr. Milman, taking this ample enumeration of Boerhaave, in his 1151st aphorism, as the text, to which we refer the reader.

This view of the subject appears also to accord better, on the whole, with our knowledge of the pre-disposing and exciting causes of the disease above detailed. The various kinds of diet, under which scurvy occasionally originates, is ill calculated to produce any particular acrimony of the fluids; and the dry pulse and glutinous pudding of the Bohemians on shore could not have the same tendency to putrefaction as the salted animal diet of seamen. Yet all these substances might equally fail, from their indigestibility, or from the defect of nutritious matter which they contained, to support the strength and vigour of the moving fibre, and would equally contribute, therefore, to produce that languor of the vital powers, which is so conspicuous in the progress of scurvy. The analogy of scurvy with the *ignis sacer*, admirably described by Lucretius, which appears to have been commonly the result of famine, and often called pestilence, (whence M. Poupert was correct in comparing the epidemic scurvy of Paris with some of the ancient plagues) seems to support the same doctrine. (See *IGNIS SACER*.) And all the pre-disposing causes, on the one hand, which are principally debilitating causes, fatigue, indolence, want of sufficient sleep, cold and moisture, and the means of prevention, on the other, which are such as support the general vigour of the constitution, moderate exercise, sufficient sleep, fresh air, warmth, &c. concur in evincing the state of the moving fibre to be the source of the morbid symptoms. The same opinion is also farther supported by the extraordinary influence of mental impressions in producing and in preventing or curing the disease. These impressions cannot suddenly change the chemical condition of the fluids; but their influence upon the living solid, through the medium of the nervous system, is manifest both in health and disease, to a degree that unlearned persons will scarcely credit. (See *IMAGINATION, Influence of*, and *IMITATION*.) The discharges of blood from the relaxed and enfeebled orifices of the vessels, the gangrenous and consequently putrescent tendency of the gums, and other delicate parts, the fainting and even dying on the slightest exertion, the dropical swellings, the labouring breath, the oppression about the heart, &c. &c. appear to be the result of diminished strength in all the muscles, and of enfeebled action in all the vessels, the consequences of a general failure of the vital or nervous power.

Such, then, appears to be the advantage, in point of argument and analogy, which the doctrine of diseased solids possesses over that of acrimony and putrefaction in the fluids. Nevertheless this theory is by no means satisfactory: it is in some measure, indeed, incompatible with the most striking and well ascertained fact, that the scurvy is not curable by those means which appear to contribute in general to the strength and activity of the solids, such as fresh animal food, wine, bark, soups, &c.; while it is speedily and certainly removed by the use of vegetable acids, which contain no nutritive quality, and are so far destitute of corroborating power, that they even induce emaciation, while they cure the disease. In truth, we can give no satisfactory theory of this disease: but our possession of a certain remedy, and our knowledge of the means of prevention, may fairly supersede all hypotheses upon the subject. In this, and in all other diseases, experience and observation are the only guides which the judicious physician will follow. The instinctive demands of the sick point out the source of relief, as hunger and thirst lead us to food and drink; and it is enough to have observed, that, by gratifying these demands, the

the disease is cured, and to have inferred, that by anticipating them it is prevented from occurring. This is the true source of all our knowledge, medical or physical; and our hypotheses respecting the obscure agencies of nature, which are incomprehensible, as the empirics of old wisely maintained, are at least superfluous: for they are not the cause, but the result of our practical information. "Reperitis deinde medicinæ remediis, homines de rationibus eorum differere cœpisse; nec post rationem medicinam esse inventam, sed post inventam medicinam, rationem esse quæsitam." Celsus, Præfat.

Before we conclude, however, we may be allowed to notice one theory, to which modern chemistry has given rise, but which appears to us to be as imperfectly developed as those to which we have already alluded. Dr. Trotter has advanced this doctrine; and we believe the late Dr. Beddoes has maintained a similar opinion. As the acidifying principle which exists, but is rather loosely combined in the vegetable acids and green vegetables (the oxygen of modern nomenclature), appears to be wanting, not only in the salted and other animal substances, but also in the farinaceous and unfermented vegetable food, which has given rise to scurvy, it has been suggested, that this oxygen may be the remedy for scurvy, and its absence from the solids and fluids of the body, the proximate cause of the disease. This supposition Dr. Trotter considers as farther confirmed by the blackness of the blood discharged, and by the speedy change to a florid hue, which the fungous ulcerations assume, within a few hours after the acids have been administered. For it is well known, that such a change is always the result of the contact of oxygen with the blood, and that it takes place regularly in the lungs, during respiration, the black blood of the veins being converted into florid arterial blood by that process. There is some plausibility in this view of the subject; but it affords no means of explaining the concurrence of the symptoms, and does not lead us to any additional expedients for the cure. In the application of the remedies all agree, and their peculiar explanations of their operation are of light importance. For, as the sage empirics of antiquity contended, "nihil istas cogitationes ad medicinam pertinere, eo quoque disci, quod, qui diversa de his fenserint, ad eandem tamen sanitatem homines perduxerint." Celsus, loc. cit.

There is a singular disease, which, in many of its symptoms, resembles the scurvy, and is commonly considered to be of the same nature, but which differs very materially in the circumstances under which it originates, and in the remedies which it requires, of which we have already treated at length under its proper head. This has been described under various denominations, such as land-scurvy, petechiæ sine febre, hæmorrhæa petechialis, purpura, &c. See PURPURA, and HÆMORRHÆA.

SCURVY-Grafts, in *Botany*. See COCHLEARIA.

SCURVY-Grafts, *Scotch*. See SOLDANEL.

SCUT, among *Sportsmen*, the tail of a hare or rabbit.

SCUTAGE, SCUTAGIUM, in *Ancient Customs*. See ESCUAGE.

SCUTARI, in *Geography*, a town of European Turkey, in the province of Albania, anciently the residence of the kings of Illyricum, situated on a lake to which it gives name; now the residence of a beglerbeg, a Greek archbishop, and a Latin bishop; 52 miles S.E. of Ragusa. N. lat. 42° 27'. E. long. 19° 14'.—Also, a town of Asiatic Turkey, in the province of Nætolia, on the Bosphorus, opposite to Constantinople, called by the ancients "Chryseopolis," as being the emporium where the Persians collected the tributes of

their acquired dominions: this town, after having experienced many vicissitudes of prosperity and adversity, is now full of houses and mosques. It is a fashion for the Turks at Constantinople to be interred at Scutari.

SCUTARIENSE PROMONTORIUM, in *Ancient Geography*, a promontory of Asia Minor, in the Thracian Bosphorus, N.E. of Byzantium.

SCUTARIUS, among the Romans, besides its ordinary signification of a shield-maker, was used to denote one of the emperor's life-guards, because their whole body was covered with armour.

SCUTCHEON. See ESCUTCHEON.

SCUTCHEON-Grafting. See ENGRAFTING.

SCUTE, a French gold coin of 3s. 4d. in the reign of king Henry V. And Catharine, queen of England, had an assurance made her of sundry castles, manors, lands, &c. valued at the sum of forty thousand *scutes*, every two of which were worth a noble.

SCUTELLA, in *Botany*, a little dish, or faucer, is used by Dillenius, Linnæus, and their followers, for the peculiar receptacle of the seeds in most species of LICHEN, see that article; and which is nearly all that we know of their fructification. This receptacle consists of a smooth disk, almost always of a different colour from the rest of the plant, as well as from its own border. Its internal substance is of a dense spongy, corky, or waxy texture, filled with innumerable parallel vertical cells, each of which contains a row of seeds, usually eight in number, one above another. The disk itself is either flat, slightly concave, or somewhat convex, bordered by a rim, formed out of the leafy or crustaceous frond, and sometimes by an elevation of its own substance. The latter is the case with those Lichenes denominated *tuberculati*, whose disk often becomes so much elevated as to overtop, or obliterate, this kind of border. The rim formed out of the frond is termed by Acharius *margo accessorius*; that which is of the substance of the disk is his *margo proprius*.

Some confusion has arisen in the English denomination of the part in question, which is now universally called a *shield*, in preference to Dillenius's word *fauces*; nor will any one, surely, disapprove of the change. The source of the Latin *scutella* is *scutum*, a shield, and Linnæus, in his *Philosophia Botanica*, appears to have intended using *scutellum*, a little shield, instead of *scutella*, a little dish. If he had kept to the former, our English word would indeed have been more strictly correct, but it is still sufficiently so to preclude any necessity of altering what is now generally adopted.

SCUTELLARIA, derived from *scutella*, a small dish or faucer, apparently in allusion to the little concave appendage which crowns the calyx. Some have thought it to be more directly derived from *scutellum*, a little shield, to which they have compared the appendage. Others have preferred the name *Cassida*, comparing the calyx of the fruit to a helmet.—Linn. Gen. 301. Schreb. 397. Willd. Sp. Pl. v. 3. 426. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 645. Prodr. Fl. Græc. Sibth. v. 1. 424. Ait. Hort. Kew. v. 3. 426. Juss. 117. Michaux Boreale Amer. v. 2. 11. Pursh v. 2. 402. Lamarck Illustr. t. 515. (Cassida; Tournef. t. 84.)—Class and order, *Didynamia Gymnospermia*. Nat. Ord. *Verticillatæ*, Linn. *Labiatæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, very short, tubular; rim almost entire, after flowering closed with a lid, permanent. *Cor.* of one petal, ringent. Tube very short, bent backwards; throat long, compressed. Upper lip concave, trifid; the middle segment concave, emarginate; lateral ones flat, rather acute, lying under the middle one.

Lower

SCUTELLARIA.

Lower lip broader, emarginate. *Stam.* Filaments four, concealed under the upper lip, two of them longer; anthers small. *Pist.* Germen superior, four-cleft; style thread-shaped, resembling the filaments in situation and length; stigma simple, incurved, pointed. *Peric.* none, except the closed calyx, which is shaped like a helmet, triangular, bursting at the lower margin. *Seeds* four, roundish.

Obs. This genus is easily and sufficiently distinguishable from all others by the fruit alone, for the closed calyx, containing the seeds, with its crest and lid, somewhat resembles a helmet.

Eff. Ch. Rim of the calyx nearly entire, closed, and covered with a lid after flowering.

1. *S. orientalis*. Yellow-flowered Skull-cap. Linn. Sp. Pl. 834. Sm. Fl. Græc. Sibth. t. 580, unpublished. (*Cassida orientalis*, chamædryos folio, flore luteo; Tourn. It. v. 2. 129, with a plate.)—Leaves with deep parallel teeth; downy beneath. Spikes cylindrical, slightly quadrangular.—Native of Barbary and the Levant, flowering from May to July. *Stems* nearly a foot high, branched from the bottom, spreading on the ground, taking root at the lower joints. *Leaves* stalked, almost pectinate, more or less downy; green above, but white underneath. *Spikes* rather short, composed of bright-yellow very handsome flowers, with ovate brownish bractæas. The whole herb is bitter. In the *Systema Vegetabilium* the corolla is said to be purple with a white lip; confounding it perhaps with the next species.

2. *S. grandiflora*. Large-flowered Skull-cap. Ait. n. 2. Sims in Curt. Mag. t. 635.—Leaves heart-shaped, deeply crenate, downy on both sides, shorter than their stalks. Spikes very short, quadrangular. Corolla hairy, four times longer than the bractæas.—Native of Siberia, and introduced by Mr. Loddiges in 1804. It flowers in July. A hardy perennial, like the last, of which indeed it may possibly be only a variety. The spikes are shorter, and the corolla is larger in proportion to the size of the bractæas, lilac-coloured, with a yellow palate. *Leaves* rounder, less downy beneath, but soft on both sides. Dr. Sims says "it approaches very nearly to the variety of *S. orientalis* found in Georgia by Tournefort, and described in his travels."

3. *S. alpina*. Alpine Skull-cap. Linn. Sp. Pl. 834. Allion. Pedem. t. 26. f. 3. "Waldst. et Kitaib. Hung. v. 2. 146. t. 137."—Leaves heart-shaped, ferrated or jagged. Spikes imbricated, roundish or slightly four-sided. Bractæas twice as short as the flower.—Native of Switzerland and Hungary. It flowers from June to October. *Stem* procumbent at first, then erect, very much branched, from six to twelve inches in height. *Leaves* on short stalks, obtuse, downy. *Flowers* pale violet-coloured, with a white upper lip. Linnæus in Sp. Pl. compares this to *supina*, meaning the following, to which it is indeed very like.

4. *S. lupulina*. Tartarian Skull-cap. Linn. Sp. Pl. 835. "Schmidel. Ic. 272. t. 73."—Leaves heart-shaped, ferrated or jagged, acute, smooth. Spikes imbricated, roundish or slightly four-sided. Bractæas the length of the flowers.—Native of Siberia and Tartary, flowering from June to September. *Stems* shrubby and trailing. *Leaves* jagged at their edges, smooth on both sides. *Flowers* white, or blue, sometimes yellowish-white, very large. In habit greatly resembling the last, but different in colour, and having much longer bractæas.

5. *S. lateriflora*. Virginian Skull-cap. Linn. Sp. Pl. 835. (*S. palustris repens virginiana major, flore minore*; Morif. Hist. v. 3. 416. n. 7.)—Leaves smooth, rough at the keel. Clusters lateral, leafy. Bractæas fetaceous.—Found on the sides of ditches and ponds between Canada

and Carolina, flowering from July to September. *Pursh.* The stems of this species resemble those of the following in height and habit, but are somewhat larger. *Leaves* stalked, ovate, ferrated. *Flowers* in lateral clusters, small, blue, each partial stalk bearing two fetaceous bractæas.

6. *S. nervosa*. Ribbed Skull-cap. Pursh n. 2.—Stem nearly simple, smooth. *Leaves* sessile, ovate, toothed, ribbed. Cluster terminal, lax, leafy.—On the banks of rivulets in Virginia, flowering in July and August. This perennial herb has blue flowers, which are larger than those of the foregoing species. *Pursh.*

7. *S. galericulata*. Common Skull-cap. Linn. Sp. Pl. 835. Fl. Brit. n. 1. Engl. Bot. t. 523. Curt. Lond. fasc. 3. t. 36. Fl. Dan. t. 637.—Leaves heart-lanceolate, crenate, rugged. *Flowers* axillary. Common on the banks of rivers, and wet ditches, as well in Britain as in other parts of Europe, flowering in July and August. *Root* perennial, creeping. *Stem* erect, one or two feet high, branched in the middle, leafy, sharply quadrangular, roughish. *Leaves* on very short stalks, spreading, unequally notched, rugose, veined, downy, paler beneath. *Flowers* axillary, solitary, nearly sessile, in pairs inclined the same way, drooping, blue, or purplish, and white.

8. *S. hastifolia*. Hastate-leaved Skull-cap. Linn. Sp. Pl. 835. (*Scutellaria folio non ferrato*; Rivin. Monop. Irr. t. 77.)—Leaves quite entire; lower ones hastate, upper arrow-shaped.—Found on the shores of fresh waters, in Sweden and Austria, but not very common. It flowers in June and July. *Root* creeping. *Stem* generally simple. *Leaves* blunter than in the preceding, not at all notched, eared at the base. *Flowers* axillary, solitary, in pairs, blue, larger than in the last species, to which it is very closely allied, and of which both Linnæus and Scopoli hint that it may be only a variety.

9. *S. minor*. Lesser Skull-cap. Linn. Sp. Pl. 835. Fl. Brit. n. 2. Engl. Bot. t. 524. Curt. Lond. fasc. 4. t. 43.—Leaves heart-ovate, nearly entire. *Flowers* axillary.—Rather a scarce native of Britain, and the south of Europe, in a moist gravelly soil; flowering about August. *Root* perennial, creeping. Whole habit much resembling *S. galericulata*, but the plant is about four times as small. *Stem* branched at the base. *Leaves* broader, rugose, mostly entire, sometimes toothed at the base, and as it were slightly hastate. *Flowers* of a delicate pink colour, rarely blueish; their lip white, spotted with red.

10. *S. humilis*. Dwarf Skull-cap. Brown Prodr. Nov. Holl. v. 1. 507.—Leaves ovate or heart-shaped, coarsely crenate; dotted and rather downy beneath. *Flowers* axillary. Calyx smoothish, half as long as the corolla.—Found by Mr. Brown at Port Jackson, as well as in the south parts of New Holland. We received specimens, in 1793, from Dr. White. This agrees in size, and somewhat in habit, with the last, but the leaves are smaller, more rounded, deeply notched, with curved bristly hairs about their ribs and margins. *Flowers* solitary, opposite, spreading different ways.

11. *S. mollis*. Soft Skull-cap. Brown ibid.—"Downy, with capitate hairs. *Leaves* heart-shaped, oblong-ovate, deeply crenate. *Flowers* axillary; their stalks as long as the footstalks."—Gathered by Mr. Brown near Port Jackson.

12. *S. angustifolia*. Narrow-leaved Skull-cap. Pursh n. 4.—"Unbranched, finely downy. *Leaves* linear. *Flowers* axillary, opposite. Stamens rather prominent."—Found by governor Lewis, on the banks of the river Kookoosky. Perennial, flowering in June. *Pursh.*

13. *S. parvula*. Minute Skull-cap. Michaux Boreali-Amer.

Amer. v. 2. 11. Pursh n. 5. — "Densely downy, unbranched. Leaves sessile, ovate, entire, all uniform. Flowers axillary, solitary."—Found by Michaux in Canada and the country of the Illinois; by Pursh on the banks of rivers in Virginia. Biennial, flowering in June and July. Not above two inches high. *Flowers* small, pale blue. *Pursh*.

14. *S. caroliniana*. Carolina Skull-cap. Lamarck Dict. v. 7. 706. Illustr. t. 515. f. 3. Pursh n. 6. — "Branched, very smooth. Leaves stalked, linear-lanceolate, acute, entire. Clusters lax, leafy. Calyx obtuse."—Gathered in Carolina by Mr. Frazer. *Poir.* Root perennial. *Leaves* about two inches long; the upper ones much diminished, accompanying the *flowers*, which are the size of *S. galericulata*, yellowish-white, spotted at the apex with blue.

15. *S. teucriifolia*. Germander-leaved Skull-cap. (*S. integrifolia*; Linn. Sp. Pl. 836, excluding the reference to Gronovius. *S. cærulea virginiana* glabra, lamii, aut potius teucrii, folio, minor; Pluk. Almagest. 338. Phyt. t. 313. f. 4. *S. teucrii folio marilandica*; Raii Hist. v. 3. 310.) — Leaves sessile, ovate; the lower ones bluntly and distantly serrated; upper entire. Flowers axillary, solitary, on hairy stalks. — Native of North America. The *stem* is above a foot high, unbranched, slender, square, smooth, leafy. *Leaves* resembling *Veronica Teucrium*, about an inch long, nearly sessile, slightly dotted beneath, smooth, except the ribs and margin, which are clothed with curved bristly hairs. *Flowers* turned one way, small. *Calyx* hairy at the ribs and margin. *Corolla* hairy, blue. Such is the plant Linnæus intended as his *integrifolia*, which he received from Kalm, along with another specimen, pasted on the same paper, which he did not perceive to be merely a smoothish variety of his own *hyssopifolia*, and which led him to quote Gronovius's *Flora Virginica* improperly in this place, as well as to choose the name of *integrifolia*. This appellation, however, being erroneous, and having caused much confusion among subsequent botanists, is best laid aside, and we have preferred one taken from the very apt synonyms of Plukenet and Ray. The figure of the former however represents the *footstalks* too long, and the *floral leaves* too small. Mr. Pursh seems not to have recognized this plant. At least we can refer it to none of his species.

16. *S. hyssopifolia*. Hyssop-leaved Skull-cap. Linn. Sp. Pl. 836. Mant. 414. Willd. n. 12. (*S. integrifolia*; Ait. n. 10. Pursh n. 7. Michaux Boreali-Amer. v. 2. 12. *S. virginiana*, hyssopi angustis foliis, flore cæruleo; Pluk. Almag. 338. t. 441. f. 6. *S. foliis integerrimis*; Gron. Virg. ed. 1. 67, excluding the references to Plukenet and Ray.) — Leaves linear-lanceolate, obtuse, entire, somewhat stalked, finely downy; copiously dotted beneath. Clusters compound, rather lax, leafy, downy. On dry hills, in a rich soil, from New York to Carolina, flowering from July to September. Perennial, very variable in the size and figure of the *leaves*, simple or branched *stems*. *Flowers* large, handsome, blue. *Pursh*. We see no reason to transfer the name of *integrifolia* to this, which has already one so greatly preferable. The whole herb, as well as the *calyx* and *corolla*, are finely downy and somewhat hoary.

17. *S. serrata*. Great Serrated Skull-cap. Andr. Repof. t. 494. Pursh n. 8. — Leaves ovate, pointed, serrated, stalked, nearly smooth. Clusters compound, rather lax, slightly downy. Bractæas lanceolate. — In fields and meadows, from Virginia to Carolina, flowering from July to September. *Pursh*. The *stem* is three feet high. *Leaves* two or three inches long, and above one broad, tapering at the base. *Flowers* copious, large and handsome, of a fine deep blue. This is a very ornamental perennial herb, worthy of culti-

vation in gardens. We received it from the fine collection of James Vere, esq. at Knightbridge. Mr. Pursh remarks that "authors take this for the *integrifolia*," meaning perhaps Mr. Donn in his *Hort. Cantab.* Mr. Aiton has it not; except under its true name, in the *Addenda* to his *Epitome*.

18. *S. pilosa*. Wood Skull-cap. Michaux Boreali-Amer. v. 2. 11. Pursh n. 9, excluding the reference to Plukenet. — Leaves remote, rhomboid-ovate, obtuse, roundly crenate, tapering at the base, downy. Clusters lax, mostly compound. Bractæas lanceolate, nearly entire. — In shady woods, from Virginia to Carolina; perennial, flowering in July and August. — Resembles the last, but is a smaller plant, with only a few leaves. *Pursh*. Possibly this author may be right in his citation of Plukenet's figure, which we have referred, like Linnæus, to our fifteenth species. It is impossible, with such bad materials, to decide, but the words of Plukenet answer best to that species.

19. *S. havanensis*. Havannah Skull-cap. Jacq. Amer. 172. Obs. fasc. 2. 5. t. 29. Willd. n. 10. Ait. n. 11. — Stem decumbent. Leaves ovate, somewhat heart-shaped, crenate. Flowers solitary, axillary. Each lip of the corolla three-cleft. — Gathered by Jacquin, on rocks near the sea at the Havannah, flowering in December. A delicate, procumbent little branching herb, with nearly smooth *leaves*, much shorter than the large, blue, axillary, stalked *flowers*. It is said to have been brought to Kew, in 1793, by Capt. Bligh, and is marked by Mr. Aiton as a perennial stove plant, flowering in May and June.

20. *S. purpurascens*. Purple-leaved West-Indian Skull-cap. Swartz. Ind. Occ. v. 2. 1013. Vahl. Symb. v. 2. 66. Willd. n. 11. — Stem prostrate. Leaves ovate, somewhat heart-shaped, toothed, smooth. Clusters terminal, naked. Each lip of the corolla three-cleft. — Native of the Caribbean islands. Stem herbaceous, branched, diffuse, like the preceding, with ascending smooth *branches*, five or six inches long. *Leaves* stalked, obtuse, distantly toothed, rather hairy, of a purplish-blue after the flowers are past; their *footstalks* very long and lax. *Clusters* erect, solitary, many-flowered, lax, an inch or two long. *Flowers* blue.

21. *S. indica*. East Indian Skull-cap. Linn. Sp. Pl. 836. Willd. n. 15. (*S. finica*, betonice foliis, floribus albis; Pluk. Amalth. 190. t. 441. f. 1.) — Stem decumbent. Leaves roundish-ovate, crenate, finely downy. Clusters terminal. Bractæas blunt, stalked, shorter than the calyx. — Native of China and the East Indies. A hoary, branched, decumbent herb, about a foot long. *Leaves* stalked, rounder and larger than in the two last. *Flowers* forming rather close *clusters*, two or three inches in length. The *Serratula amara*, Rumph. Ambion. v. 6. 459. t. 170. f. 1. not 2, can have nothing to do with this, being a smooth plant, with twin axillary *flowers*, and a *capsule*, containing numerous minute *seeds*. It seems that Linnæus did not always advert to every particular in the descriptions to which he referred; for there is here no mistake as to what he intended, the plate of the Herbarium Amboinense being marked with his own hand.

22. *S. hirta*. Cretan Skull-cap. Sm. Prodr. Fl. Græc. Sibth. 1417. Fl. Græc. t. 583, unpublished. (*Callida cretica minor*, catarizæ folio, flore subcæruleo; Tourn. Cor. 11. Scordote secondo di Plinio; Pon. Bald. 91. t. 93.) — Leaves heart-shaped, serrated, hairy as well as the stem. Spikes dense, unilateral. Bractæas stalked, half the length of the flowers. — Native of shady situations on the mountains of Crete. The *root* is perennial, fibrous, somewhat woody. *Stems* several, spreading, ascending, about a span high, leafy, rough with spreading hairs. *Leaves* rather pale, coarsely serrated, hoary with long white hairs. *Footstalks* hairy, almost

almost as long as the leaves. *Spikes* somewhat aggregate, erect, dense, many-flowered, hairy, two or three inches long. *Bracteas* ovate, entire, longer than the *calyx*. *Flowers* all turned one way. *Calyx* covered with very long dense hairs, spreading in all directions. *Corolla* downy; its upper lip pale lilac; lower, as well as the tube, greenish-white.

23. *S. peregrina*. Dark-red Skull-cap. Linn. Sp. Pl. 836. Willd. n. 13. Ait. n. 12. Sm. Fl. Græc. Sibth. t. 582, unpublished.—Leaves heart-shaped, ferrated, minutely downy as well as the stem. *Spikes* elongated, unilateral. *Bracteas* two-ranked, ovate, stalked, about the length of the flowers. *Corolla* hairy, its lower lip notched.—Native of Italy, Hungary, and the Levant. A more slender and upright plant than the last, about a foot and half high. *Stem* purplish, downy, not hairy. *Leaves* oblong-heart-shaped, neatly crenate, clothed sparingly with short hairs, sometimes almost smooth. *Spikes* six or eight inches long, with large *bracteas*. *Calyx* covered with short hairs. *Corolla* of a dark blood-red, with a pale yellow palate; its tube elongated, clothed with long spreading hairs.

24. *S. albida*. Pale Hairy-cupped Skull-cap. Linn. Mant. 248. Willd. n. 2. Ait. n. 3. Sm. Fl. Græc. Sibth. t. 581, unpublished. (*S. teucris* facie; Bauh. Hist. v. 3. 291.)—Leaves heart-shaped, ferrated, downy as well as the stem. *Spikes* elongated, unilateral. *Bracteas* two-ranked, ovate, stalked, nearly equal to the flowers. *Corolla* downy, its lower lip entire.—Native of the Levant; found by Dr. Sibthorp on Mount Olympus. Very nearly akin to the last, and not in the least resembling *orientalis*, to which Linnæus, in his *Système Vegetabilium*, by some unaccountable error, compares this species. It is, if possible, more strange that he should at one time have confounded *albida* with *alpina*, as appears by his herbarium. *S. albida* differs from *peregrina* in having broader, more coarsely ferrated leaves, more crowded and numerous flowers, whose *corolla* is cream-coloured, downy, not clothed with long hairs; the edge of its lower lip even and entire, not lobed, undulated, or notched. The *calyx*, on the contrary, bears much longer hairs than that of *peregrina*.

25. *S. altissima*. Tall Skull-cap. Linn. Sp. Pl. 836. Willd. n. 16. Ait. n. 13. (*S. Columnæ*; Allion. Pedem. v. 1. 40. t. 84. f. 2. Willd. n. 14. Cassida; Column. Ecphr. v. 1. 187. t. 189. *C. orientalis altissima, urticæ folio*; Tourn. Cor. 11.)—Leaves heart-shaped, ferrated, acute, nearly smooth. *Spikes* elongated, unilateral. *Bracteas* ovate, acute, stalked, shorter than the calyx.—Native of Italy, Mount Caucasus, and the Levant. Miller cultivated it in 1731, and one of his own specimens, compared with those of Allioni, have enabled us to verify the above synonyms, and to reduce two reputed species, of this difficult and confused genus, into one. The present differs from both the two last, in having leaves twice their size, besprinkled with only a few minute scattered hairs, so as to feel nearly smooth. But its most essential character consists in the smallness of the *bracteas*, whose points do not extend beyond the calyx. The *spikes* therefore appear almost naked, consisting of numerous purple downy flowers, whose *calyx*, like the *flower-stalks* and *bracteas*, is rough with glandular viscid hairs.

The last species in Linnæus, Willdenow, and Aiton, *S. cretica*, require to be expunged, being the very same plant as *Teucrium Arduini*, Linn. Mant. 81, and announced as such in Sm. Prodr. Fl. Græc. Sibth. v. 1. 392. Its calyx and habit accord with *Teucrium*, not with *Scutellaria*.

SCUTELLARIA, in Gardening, contains plants of the hardy, herbaceous, perennial kind, of which the species cultivated are; the entire-leaved skull-cap (*S. integrifolia*); the Flo-

rentine skull-cap (*S. peregrina*); and the tall skull-cap (*S. altissima*).

Method of Culture.—These are all raised from seed, which should be sown in autumn or spring, but the former is the better season, in the places where they are to remain, or in a border to be removed afterwards. When the plants are up they should be properly thinned out and kept free from weeds.

They afford variety in the borders, clumps, and other parts of pleasure-grounds, when properly planted in them.

SCUTELLUM, in Botany, a little shield, sometimes used for the fructification of Lichens, instead of SCUTELLA, see that article.

SCUTELLUM, or *Escutcheon*, in the *History of Insects*, is the posterior part of the thorax; it is frequently triangular, and appears to be separated from the thorax by its intervening suture, as in most of the coleoptera.

SCUTHINON, in Botany, a name given by the ancient Greeks to a yellow wood, called also *thapsus*, *chrysoxylon*, and *Scythicum lignum*. It was of a beautiful colour, and was used in dyeing and in colouring the hair yellow, which was the favourite colour of that time.

The same authors have sometimes also called it *cythion*, or *cuthion*: this is only the former word with the initial *c* taken away, as it was common with them to do in regard to many words; thus they called the smilax *milax*, the smaragdus *maragdus*, and so of many more.

SCUTIFORME Os, in Anatomy, the chief bone of the knee, called also *patella*, *mola*, &c.

SCUTIFORMIS, CARTILAGO, one of the pieces composing the larynx. See LARYNX.

SCUTTLE, in Agriculture, the name of a shallow basket, or sort of wicker-bowl, much used in the barn and for other purposes. The large ones have handles, but the small ones are without them. They are often also employed for stable purposes.

SCUTTLES, in Ship-Building, are square openings cut through the decks, much less than the hatchways, for the purpose of handing small things up from deck to deck. There are also scuttles cut through the ship's side, some for the admission of air and light into the cabins, &c. between decks, and some between the ports of smaller vessels, through which the *sweeps* are used, to row the vessel along in calms.

SCUTTLE-Hatch, in a Ship, the little hatch that covers the scuttle.

SCUTTLING, in Sea Language, the act of cutting large holes through the bottom or sides of a ship either when she is stranded or overfet, and continues to float on the surface. It is commonly designed for taking out the whole or part of the cargo, provisions, stores, &c. with all possible expedition.

The decks are scuttled sometimes to put pumps down to assist the chain-pumps on emergency or failure.

SCUTTOCK HILLS, in Geography, hills of the United States of America, in the district of Maine; 8 miles N. of New Bristol.

SCUTTOCK Point, a cape on the coast of Maine. N. lat. 44° 18'. W. long. 67° 58'.

SCUTULA, in Botany, so named by Loureiro, from the shape of its berry, which resembles a little shield.—Loureir. Cochinch. 235.—Class and order, *Octandria Monogynia*. Nat. Ord.

Gen. Ch. *Cal.* Perianth of one leaf, truncated, spreading, shield-like, fleshy, coloured, smooth on the outside. *Cor.* Petals five, roundish, pointed, converging, situated on the margin of the calyx. *Stam.* Filaments eight, awl-shaped, inflexed,

inflexed, inserted below the petals, and about equal to them in length; anthers oblong, curved. *Pist.* Germen imbedded in the calyx; style thread-shaped, as long as the stamens; stigma simple. *Peric.* Berry formed of the calyx, thickened, of eight cells. *Seeds* solitary, somewhat compressed.

Efl. Ch. Calyx entire, becoming pulpy. Petals five. Berry of eight cells.

1. *S. scutellata*. Loureir. — "Stalks many-flowered. Berries compressed." — Native of Cochinchina. A small tree, about eight feet high, with spreading branches. Leaves opposite, lanceolate, entire, smooth, thickest at the margin. Flowers lateral, many on a stalk, all over violet-coloured.

2. *S. umbellata*. Loureir. — "Flowers in umbels. Berries roundish." — Native of bushy places in Cochinchina. A shrub about four feet high, much branched. Leaves opposite, sessile, ovate, lanceolate, entire, thick. Flowers small, terminal, variegated with white and blue, in umbels, or large cymes.

The berries of this genus are said to be of an astringent, strengthening quality, vying with those of the myrtle.

Scutula rests entirely upon Loureir's authority. Some parts of his description we have omitted, as unintelligible. The genus may possibly be referrible to *Memeçylon*.

SCUTUM SOBIESKI, *Sobiecki's Shield*, in *Astronomy*, a constellation formed by Hevelius; the stars of which in his catalogue are seven: four of these are enumerated in the *Aquila* in the *Britannic* catalogue. See *CONSTELLATION*.

SCUTUM, in *Natural History*, the name of a genus of the *echini marini*; the characters of which are, that it is a shell of an irregular figure, which on the lower part represents, in some measure, a shield; on the superficies it has the shape of a five-leaved flower; its mouth is in the middle of the base, and the aperture for the anus at the edge.

Of this genus of the *echini* there are two kinds, the angular and the oval.

Of the first of these kinds, the angular *scuta*, there are only two known species: the first a lower flattish kind, and the second a more elevated one.

Of the second, or the oval *scuta*, there are three known species. Klein's *Echinod.* p. 28.

SCUTUM, in *Pharmacy*, a name given to a solid stomachic topic, whether made in form of a bag, with medicinal ingredients sewed in it, or of a plaster. It is always fashioned into the shape of a shield. The plasters, for this purpose, were used to be made of the warm stomachic gums, and the bags were filled with the warm aromatic powders; and they were worn to warm and strengthen the stomach, correct a cold intemperature, and promote digestion, and prevent vomiting.

The patella, or knee-pan, is also sometimes called by anatomists *scutum*.

SCYBALA, *σκύβαλα*, in *Medicine*, an appellation given to the excrement of the bowels, when it is hard, dry, and formed into small masses, or little balls, resembling the excrement of sheep. This form is always given to the stools by their remora or delay in the intestines, and is sometimes merely the result of ordinary constipation, and is then probably produced in the cellular surface of the colon, or great intestine; but in some cases, *scybala* are lodged higher in the canal, exciting great irritation in the bowels, and even violent purging of thin slimy stools, together with much fruitless straining, or *tenesmus*; which constitute, in fact, one form of the dysentery, or flux. In these cases, it is obvious that, if astringents are given, with a view of checking the purging, the disease must be aggravated; for the enemy is thus closer locked up in the bowels; and that effectual cathartics must be administered by the mouth, to expel the accumulated excrement. Accordingly the appearance of *scybala* in the

stools, in these cases, is the most favourable sign, as it indicates the removal of the cause of the disease. See *DYSENTERY*, and *TENESMUS*.

SCYBELITES, a term used by the ancients to express a sort of must, or juice of the grapes, which distilled from them spontaneously, without pressing.

SCYDRUS, in *Ancient Geography*, a river of Italy, in that part of Magna Græcia called Brutium.

SCYLACE, SIKI, a small town of Asia Minor, in Bithynia, at the entrance and to the west of a small gulf called "Cianus Sinus." It was founded, according to Herodotus, by a colony of Pelasgi.

SCYLACION, a word by which the ancients expressed the flesh of puppies, which they recommended as of great service in many chronic cases.

SCYLAX, in *Biography*, an ancient mathematician and geographer, was a native of Caryanda, in Caria. He is noticed by Herodotus in the following passage. "A great part of Asia was discovered by Darius, son of Hytaspes, who wishing to ascertain the place where the river Indus falls into the sea, dispatched various persons in whom he could confide, and among them Scylax of Caryanda. Proceeding from the city of Caspatyrus, and the Paçtyian territory, they sailed down the river in an easterly direction to the sea; and then continuing their voyage on the sea towards the west, in the thirtieth month they arrived at the place from which the Egyptian king dispatched the Phœnicians to circumnavigate Lybia. After their voyage, Darius subdued the Indians, and opened the navigation of the sea." Suidas gives a very brief account of Scylax, in which he has evidently confounded different persons of the same name. "Scylax of Caryanda, a mathematician and musician, wrote a periplus of the coasts beyond the pillars of Hercules, a book respecting the Heraclides, a description of the circuit of the earth, and an answer to Polybius's history." The Periplus which still remains, bearing the name of Scylax, is a brief survey of the countries along the shores of the Mediterranean and Euxine seas, together with part of the western coast of Africa surveyed by Hanno. It commences with the straits of Gibraltar, and proceeding along the coasts of Spain and Gaul, round the Mediterranean, returns to the same point, and then briefly describes the coasts of Africa, along the Atlantic, as far as the island of Cerne. This, after all, is in general little more than an enumeration of nations, towns, and distances, though intermixed with some occasional notices of natural productions, and in a few instances detailing the common fables of the age. It concludes with an account of the passages across the sea from Greece into Asia, and an enumeration of twenty important islands, in the order of their magnitudes. A question has been raised whether the Periplus remaining be the work of the ancient Scylax, or of some later writer, and critics of high rank in literature have taken opposite sides. The subject is discussed in the fourth volume of the *Athenæum*, 1808, to which we refer our readers for the arguments on both sides of the question. It is almost certain that the ancients possessed the extant Periplus, and that they attributed it to the Scylax mentioned by Herodotus. It has come down to us in a corrupted state: it was first published from a palatine MS. by Hoefschelius and others in the year 1600. It was afterwards edited by Isaac Vossius in 1639; by Gronovius in 1697; by Hudson in 1698. *Athenæum*, vol. iv. p. 32.

SCYLAX, in *Ancient Geography*, a river of Asia, in Pontus, which ran into the Iris, after this latter river had pursued an easterly course, and watered the town of Amasia, according to Strabo.

SCYLDWIT, in our *Old Writers*, a mulct or fine for any fault.

It comes from the Saxon *scilde*, i. e. *delictum*; and *wite*, i. e. *pœna*.

SCYLITZA, JOHN, *Curopolates*, in *Biography*, a Greek historian, known for his abridgment of history from the death of Nicephorus Logothetes, in 811, to the deposition of Nicephorus Botoniates, in 1081. This history, from the year 1067, is the same as that of Cedrenus, which has caused a discussion among the learned, which of the two was the plagiarist. Scylitza is thought to have been a native of Lesser Asia, and a prefect of the guards before he attained the dignity of curopolates. A Latin translation of his history entire, was published at Venice in 1570: and the part concerning which there is no dispute was printed in Greek and Latin, at Paris, in 1647. Moreri.

SCYLLA, in *Ancient and Modern Geography*, a rock at the entrance of the Straits of Messina, about 200 feet in height, now cape *Sciglio*; which see. Scylla was famous in antiquity for the danger which it presented to navigators who approached it. The rock, personified by Homer in his *Odyssey*, and represented as a devouring monster, has been destroyed by a late earthquake. Concerning its situation with regard to Charybdis, and other particulars, we refer to CHARYBDIS.

SCYLLA, or *Scylleum*, a town of Italy, in Brutium.—Also, a desert island in the vicinity of the Thracian Chersonesus.

SCYLLÆA, in *Natural History*, a genus of the Vermes Mollusca class and order, whose generic character is, body compressed, and grooved along the back; the mouth consists of a terminal toothless aperture; the tentacula or arms three on each side, and placed beneath. There are only two

Species.

* PELAGICA. The body of this species is fixed; the four extreme arms are alike; the middle ones papillous. It inhabits the ocean, and is generally found among floating seaweed. Independently of its specific character, it is described as having a roundish oblong body; broader behind, and obtuse; the mouth is placed at the end of the smaller extremity; the back is grooved with a crenulate hollow, by which it affixes itself to sea-weed; the extreme arms are smaller and rounded; the middle pair is oblong, foliaceous, bending over and sprinkled within with papillæ.

GOMPHODENSIS. The body is detached; the first pair of arms is naked and hollow at the tip; the others have branched fibres within. The body is about an inch long, pellucid, yellowish, with rusty brown dots; the back is flat, dotted with brown at the margins, with a row of blue dots down the middle; the tail is compressed, with an elevated rounded back, and furnished on each side with small branched fibres; the abdomen is dotted with blue, and rough, with a row of five whitish papillæ down the middle of each side; the first pair of arms is the lesser, the rest are contiguous, with a denticulate margin.

SCYLLEUM PROMONTORIUM, in *Ancient Geography*, the promontory of Scylla, or of Skilleo, that part of the Argolide which advances towards the south-east.

SCYMNITÆ, a people of Asiatic Sarmatia, between the Sapothrenæ and the Amazons, according to Ptolemy.

SCYMNUS, in *Ichthyology*, a name used by Ælian, Apian, and many other of the old Greek writers, for the fish called *sculion* by Aristotle. This is a species of the squalus, called by Artedi and others the squalus with the pinna ani placed in the midst, between the anus and tail: the *catulus vulgaris* and *catulus major* of authors.

SCYPHOPHORUS, in *Botany*, from *σκυφος*, a large kind of drinking cup, and *φορος*, bearing, alluding to the dilated cup-shaped stalks, resembling wine-glasses, borne by the leaves, on whose margins the fructifying tubercles are seated. This is the denomination of the 21st tribe, or section, of the LICHENES, see that article, in the *Prodromus* of Acharius, which are well known to the vulgar, as well as the learned botanist, by the name of Cup-moss, or *Lichenes pyxidati*. The above name is however sunk in that of *Bæomyces*, in the *Methodus* of that author; though Michaux uses it generically in his *Flora Boreali-Americana*, v. 2. 328.

SCYPHUS, among the Romans, a very large kind of drinking cup. The scyphus was called the cup of Hercules, as that of Bacchus, *liberi patris*, was named *cantharus*.

SCYPIIUM, in *Ancient Geography*, a town of Asia Minor, in Ionia, on the confines of the country of the Colophonians, according to Pausanias.

SCYRA, in our *Old Writers*, a fine imposed on such as neglected to attend the *scyregemot court*, which all tenants were bound to do.

SCYRAS, in *Ancient Geography*, a river or stream of Laconia, which discharged itself into the gulf of Laconia. Near it was a temple of Apollo, and an altar of Jupiter. Pausanias, lib. iii. Lacon. c. 25.

SCYREGEMOT, or SCYREMOT, in *Ancient Customs*, a county-court held twice every year by the bishop of the diocese, and the ealdorman, or sheriff; in which both the ecclesiastical and temporal laws were given in charge to the county.

In the time of Canutus the scyregemot was held thrice every year. Edward the Confessor appointed it to be held twelve times in the year.

SCYRI, in *Ancient Geography*, a people of India, in the vicinity of Ariana.

SCYRIUM MARMOR, a name given by the ancients sometimes to a white, and sometimes to a yellowish marble, both used in the public buildings of the Romans, but seldom in statuary, not being capable of a high polish.

SCYROS, in *Ancient Geography*, an island in the Archipelago, situated to the E. of the isle of Eubœa, and very near it. The ancients pretend that Achilles spent the first years of his life here, disguised like a female, in the court of Lycomedes. It was in alliance with Troy, as appears from Agamemnon's having made a conquest of it. See SCIRO.

SCYTALA, an island of the Arabic gulf.

SCYTALA, in *Mechanics*, a term which some writers use for a kind of radius, or spoke, standing out from the axis of a machine, as a handle or lever, to turn it round, and work it by.

SCYTALA LACONICA, in *Antiquity*, a stratagem, or device, of the Lacedæmonians, for the secret writings of letters to their correspondents; so that if they should chance to be intercepted, nobody might be able to read them.

To this end they had two wooden rollers, or cylinders, perfectly alike, and equal; one of which was kept in the city, the other by the person to whom the letter was directed. For the letter, a skin of very thin parchment was wrapped round the roller, and on this the matter was written; which done, it was taken off, and sent away to the party, who, upon putting it in the same manner upon his roller, found the lines and words, which were before its application to the roller confusedly disjoined, and altogether unintelligible, in the very same disposition as when they were first written. Plut. in Vit. Lyfand.

This expedient they set a very high value on; though, in truth,

truth, artless and gross enough : the moderns have improved vastly on this method of writing. See CIPHER.

It should seem, that besides this scytala, used for political and military purposes, private persons made use of a contrivance somewhat similar, to prevent deceptions in contracts ; but these were exactly like our tallies.

SCYTALE, in *Zoology*, the name given by the ancients to a species of serpent, which was very long and thin, and equally big all along the body, so that the tail was not easily distinguished from the head.

Linnæus mentions two animals under this title ; one, a species of anguis or snake, and the other a species of the *Boa* ; which see.

SCYTALIA, in *Botany*, elegantly so named by Gærtner, from *σκληρ*, a *skin*, or *hide*, and *σχιζαλν*, a *thong*, in allusion to the leathery substance and colour of the skin of the dried fruit, as also to the little shield-like tubercles, with which its outside is beset, resembling a coat of mail. Schreber has followed this author : but the same genus was published two years afterwards by Loureiro, under the name of *Dimocarpus*, indicating its double or twin fruit, which Willdenow has unawares retained, though in every respect less eligible. Hence the latter appellation is also adopted in the Hortus Kewensis, the plan of this book being, as much as possible, to follow Willdenow. Had we been aware that it would have done so in the present instance, we might perhaps have yielded our better judgment to convenience, and have given the history of the genus under the head of *Dimocarpus* ; but this not being the case, we shall exhibit it here, acknowledging our preference for *Scytalia*.—Gærtner. Sem. v. 1. 197. t. 42. Schreb. Gen. 262. (Dimocarpus ; Loureir. Cochinch. 233. Willd. Sp. Pl. v. 2. 346. Ait. Hort. Kew. v. 2. 354. Euphoria ; Juss. 247. Lamarck Illustr. t. 306.) Class and order, *Octandria Monogynia*. Nat. Ord. *Tribilata*, Linn. *Sapindi*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, very small, with five minute teeth. Cor. Petals five, small, reflexed, hairy on the inner surface, sometimes wanting. Stam. Filaments eight, sometimes but six, awl-shaped, hairy, longer than the petals, dilated at the base ; anthers heart-shaped, incumbent. Pist. Germen superior, two-lobed, somewhat stalked ; style shorter than the stamens ; stigmas two, spreading. Peric. Berries two, ovate or globose, with a coriaceous warty coat, pulpy within, each of one cell. Seed solitary, large, elliptical, polished, obliquely cut away at the base, where it is inserted into the slightly elevated bottom of the pericarp.

Obf. Gærtner has described as a fleshy tunic of the seed, what is really only the dried pulp of the berry.

Ess. Ch. Calyx inferior, with five shallow teeth. Petals five, hairy, or none. Berries two, coriaceous, warty. Seeds solitary, elliptical, polished.

1. *S. Litchi*. Lee-chee, or Apetalous Scytalia. (Dimocarpus Litchi ; Ait. Hort. Kew. v. 2. 354. Loureir. n. 1. Litchi chinensis ; Sonnerat Ind. Or. v. 2. 230. t. 129. Sapindus edulis ; Ait. ed. 1. v. 2. 36.)—Flowers with six stamens, and no petals. Fruit with prominent warts.—Native of China, Cochinchina, and Tunkin. The celebrated governor Hastings is said to have sent this plant to England in 1786, and it is marked as flowering in the stove at Kew, in May and June. The younger Linnæus, however, appears to have obtained a specimen of the leaves, from the collection of the marquis of Rockingham at Wimbleton, during his stay in England in the spring of 1782. The *Litchi* is described by Sonnerat as a large tree, with a soft white wood, abounding in pith. The leaves are alternate, stalked, abruptly pinnate, consisting of three or four pair

of opposite, stalked, elliptic-lanceolate, pointed, entire, equal leaflets, quite smooth on both sides, evergreen, each furnished with a midrib, and numerous small interbranching veins, the latter scarcely visible but in a dried state. Each leaflet is three or four inches long. Panicles terminal, compound, repeatedly branched. Flowers small, greenish, with a very downy calyx, but no petals. In some we find eight stamens, but in the same panicle others have only six. The berry, usually solitary when ripe, is nearly globular, concave at the base, an inch or more in diameter, reddish, covered with very numerous, close, prominent tubercles. It is of an agreeable flavour, and said to be one of the best fruits of the countries where it grows. The Chinese dry it in ovens for exportation. Some which we have tasted, in England, contained a firm very acid pulp, not unlike the taste of tamarinds.

2. *S. Longan*. Longan, or Many-petalled Scytalia. (Dimocarpus Longan ; Ait. Hort. Kew. v. 2. 354. Loureir. n. 2.)—Flowers with eight stamens and five petals. Fruit nearly smooth.—Native of China. Cultivated in that country, Cochinchina, the East Indies, the Mauritius, &c. This is also a large tree, with a sweet and grateful fruit, not half the size of the last, more precisely globular, and either quite smooth, or slightly scaly, not warty. The leaflets are rather more numerous than in the former, shorter, blunter, and more elliptical ; at least in our East Indian specimens. In one from the isle de Bourbon, marked *Longan*, the leaflets are oblique, or unequal, at the base, alternate, and taper-pointed. The fruit is quite smooth. We suspect this to be rather some *Sapindus*, confounded with the true *Longan*.

Loureiro mentions two more species unknown to us, one of which, his *Dimocarpus informis*, seems to be the wild state of the *Litchi*, in the woods of Cochinchina. He speaks of the wood of all the four as of an excellent quality, heavy and hard, of a brownish-red. The same author relates, that the *Litchi*, being impatient of cold, as well as of great heat, is most cultivated in the southern provinces of China, and the northern ones of Cochinchina. As the fruit will not ripen at Peking in the ordinary way of cultivation, trees in flower are sent thither by water, so as to yield ripe fruit, for the emperor's use, on their arrival. This is attended with great labour and expence.

SCYTHÆ, *Σκυθαί*, among the Athenians, a designation sometimes given to the officers, more usually called *lexiarchi*.

They had the name Scythæ, because they were often natives of Scythia who were chosen *lexiarchi*, as being brawny and sturdy fellows.

SCYTHARION, in *Botany*, a name given by the ancient Greek writers to a tree, whose wood was of a fine yellow colour, and was used in those early times to dye things yellow : it was called also *Scythicum lignum*, from its country, and *chrysoxylon*, or golden wood, from its fine yellow colour. It has been supposed that this was the same with the *cotinus coriaria* of the Romans ; but this is an erroneous conjecture, since the wood of this tree dyed a yellow colour, and that a brownish-red, or a clear and pure red, according as the infusion was made more or less strong. This scytharion, therefore, could not be the same with the *cotinus*, but it certainly is the same with the *thapsus* of the Greeks.

SCYTHE, in *Agriculture*, the implement used in mowing, being a crooked blade joined at right angles to a long pole, or handle. It is sometimes written *sithe*, or *sythe*. See MOWING.

Common scythes are of several different constructions and kinds,

kinds, in different counties. In most of those more towards the northern extremity of the island, they are of a much greater length than those which are employed in the southern districts of the kingdom. Both the extremes are, however, probably disadvantageous in some respects. Those which are neither too long nor too short are unquestionably the best fitted for general use, and capable of being employed with the greatest ease and convenience by the labourer. The tool is commonly furnished and fitted up differently for different purposes, as has been noticed under the heads to which they belong. See *MOWING, REAPING, &c.*

The stiff Flemish scythe is in use in some places for cutting bean, and other strong crops of the corn kind. It has the name of bean *peck* in some parts of Essex; and though it is thought by some to beat out the seed too much, in the hands of workmen who understand the use of it, very good clean work can be made with it, without any such mischief taking place, and they rid work in this way much faster than by the common tool and method.

In Cheshire, they make use of a strong tool of this sort, called the *hoddling-scythe*, the blade of which is about twenty inches in length, but curved in a different way to the common scythe, the edge being nearly in one way of it, in a straight direction from the heel to the point; but the flat part of the blade forms a curvature, which varies about four inches from a straight line. The handle or sneath, to which the blade is fixed, is about three feet six inches long, and has one scythe-like handle placed about eighteen inches from the top. When the work is performed, one hand is placed upon the top of the shaft or sneyd, and with the handle in the other, the crown of the rush root is scooped out by the concave part of the blade, in consequence of a smart stroke being given by the tool. The early spring is considered as the most proper season for effecting this sort of business; and it is advisable to carry off the rush roots, and form a compost with them; the hod-holes, or cavities made by the tool, being filled level with the surface of the ground with some earthy material, and sown with hay or grass-seeds. This tool is yet but little known, except in the above district, where it has been used to considerable extent in many parts, with the most beneficial effects in clearing the lands from rushes; many scores of acres of low meadow and marshy lands having been in this way freed from them, and with the aid of gutters, rendered of more than double their former value.

Short strong stiff scythes are made use of in most places, for clearing away and removing all sorts of shrubby plants from grounds, such as those of the broom, briar, furze, and several other similar kinds.

SCYTHIA, in *Ancient Geography*, is a vast territory, which has been confounded by some geographers with Tartary or Tartary, of which it is only a part (see *TARTARY*), extended from the Ister, or Danube, that is, from about the 25th to almost the 116th degree of E. longitude. It was divided into Scythia in Europe, and Scythia in Asia; including, however, the two Sarmatias, or Sauromatias, now the Circassian Tartary, which lay between and separated the two Scythias from each other. Sarmatia was also distinguished into European and Asiatic, divided from the European Scythia by the river Don or Tanais, which falls into the Palus Mæotis, and from the Asiatic by the Rha, now Volga, which empties itself into the Caspian sea. (See *SARMATIA*.) Accordingly the two Scythias were only parted by the boundaries of Europe and Asia, that is, by the river Tanais, descending, as it is supposed, from the Rhiphæan mountains into the Palus Mæotis. For, beyond those mountains northward, the Scythians did not advance

into any of those remote regions; so that these were the proper confines of the Asiatic Scythia on the west. The northern boundaries reached to the Hyperborean or Frozen sea, called also by the ancients the Scythian sea, the Cronian, Amalchian or Almachian, the Dead sea, and by some other names equally expressive of extreme cold and ice. On the east, they are supposed to have extended to the promontory of Tabis, and to have been bounded by the Cassian mountains, which parted Scythia from the kingdom of Seres, now Katai, Cathay, or Northern China; and even this last was by some of the ancients taken for part of Eastern Scythia; so that, on that side, it had no other boundaries, according to Ptolemy, than the unknown tracts beyond it: and on the south it was bounded by the Indian sea, by mount Caucasus, and the Caspian. As to the more northern parts of Scythia, it is, on account of its extreme cold, uninhabitable, except by wolves and other wild beasts; and hence they seem to have been unknown to the ancients beyond the 50th degree north. The territory beyond that degree was denominated Terra incognita. But the southern regions, better known to them, were divided into three parts, *viz.* Scythia within, and Scythia without, or beyond Imaus, and Sarmatia, which, as we have already said, lay between the former and the European Scythia, and which had been so blended with it, that the only difference between them was the name. Accordingly, Ptolemy bounds the Scythia on this side of Imaus on the west by Asiatic Sarmatia, by mount Imaus on the east, by the Terra incognita on the north, and on the south and south-east by the Sacæ, Sogdiani, and Margiani. The principal mountains in this part Ptolemy reckons to be the Alani to the east; the Rhymnici, from which flowed the Rhymnus into the Rha; the Norofus, from which sprung the Daix, the Aspifii, the Sapuri, the Syebi, and the Anaici. The rivers were the Rhymnus, the Daix, the Jaxartes, the Jastus, the Polytimetus, and the Oxus. The inhabitants of this part, according to the same geographer, were, towards the north, the Alani, Sufobeni, and Agathyrsi; and next to these, the Sætiani, the Massæi, and the Anaici. Near the Imaus were the Thaces; near the eastern sources of the Rha, the Rhobasci, Azani, and Jordii; to the south, and near the river, was the country called Conadipsas regio; and near this, Corasphi, Orgazi, Jotæ, and Aonfi; next to these, the Jaxartæ, a considerable nation, on the river of the same name; to the south of the Sætiani were the Mologeni, and next to them the Samnitæ; and below the Messæi and the Alani mountains were the Zaretæ and the Sazonæ; to the east of the Rhymnic mountains were the Tybiacæ; and below them the Zaretæ, Tabeini, Jastæ, and Machageni, near mount Norofus; above them were the Orofbes and Norofsi; and more to the south, the Cachassæ Scythæ; to the west of the Aspifii, the Aspifii Scythæ; and east of them, the Galactophagi Scythæ; and east of the Syebi, the Tapurei, and the Ascatancæ Scythæ. The Anaici lay to the south of the Agathyrsi, and to the east of the Tapurei. The Ascatancæ extended to mount Imaus; and near the Jaxartes, between the mouths of the two rivers, were the Ariacæ, the Sagaraucæ, and the Rhibii, near the Oxus. The Scythia beyond Imaus, according to the same geographer, was bounded on the north by the mountains, on the east by Serica, on the south by part of India on this side of the Ganges, and on the west by the interior of Scythia and the Sacæ. The mountains of this part are the Auxacii, Cassii, and Emodi. The inhabitants were, towards the northern part, the Abii; to the south, the Hippophagi Scythæ, those of the Regio Auxactis, and the Regio Casia, the Chatæ-Scythæ; and near the Emodi, the Charauni.

Scythæ. The towns were Auzacia, Ifledon Scythica, Charauna, and Sæta. Pomponius Mela assigns to the Scythians much the same extent and boundaries. The Scythia Pontica was called by the Greeks Mœsia.

The Asiatic Scythia, therefore, comprehended in general Great Tartary, and Russia in Asia; and, in particular, the Scythia beyond or without Imaus contained the regions of Bogdoi, or Ostiacoi, and Tunguri. The Scythia within or on this side of Imaus comprehended Turkestan, and Mongul, the Usbeck or Zagatai, Kalmuck and Nogaian Tartars, besides Siberia, the land of the Samoiedes, and Nova Zembla. The three last mentioned countries, not being so soon inhabited as the former, were wholly unknown to the ancients; and the former were peopled by the Bactrians, Sogdians, Gandari, Sacæ, and Massagetæ. Sarmatia contained Albania, Iberia, and Colchis, which now constitute the Circassian Tartary and the province of Georgia. (See CIRCASSIA and GEORGIA.) The seas of Scythia, besides the Frozen and Indian ocean, were the Caspian, the Euxine, and the Palus Mæotis. The rivers, besides those already mentioned, or the Rha or Volga, and the Tanais or Don, were the Oby, Lena, Amur, and Helum, all of which are in Great Tartary: to which we may add the Jaxartes and the Oxus, which discharged themselves into the Caspian sea; in which sea were islands called the Scythian islands. The most noted mountains were the Taurus, Imaus, and Caucasus.

European Scythia, whose confines westward have been fixed at the Tanais, reached towards the south-west to the Po and the Alps, by which it was divided from the Celtes, or Celto-Gallia, and by the Rhine northward. On the south it was bounded by the Ister or Danube, and the Euxine sea; which boundaries were continually changing, on account of the mutual encroachments of the Celtes and Scythians; and as to its northern limits, which have not been precisely ascertained, they have been supposed to stretch to the spring-heads of the Borysthenes or Dnieper, and the Rha or Volga, and so to that of the Tanais. The ancients divided this country into Scythia Arimaspea, lying eastward, and joining to Asian Scythia, and European Sarmatia on the west; which were contiguous to each other, and stretching for some interval from north to south, without any perceptible line of separation. In Scythia, properly so called, were the Arimaspei on the north; the Getæ, or Dacians, along the Danube, on the south; and the Neuri between these two. It therefore contained the European Russia, and the lesser Crim Tartary, eastward; and on the west, Lithuania, Poland, part of Hungary, Transylvania, Walachia, Bulgaria, and Moldavia. This Scythia had no other sea besides the Sarmatian, or Mare Scythicum, now called the Baltic, with the gulfs of Bothnia and Finland, and the White sea joining to the Northern ocean, all unknown to the ancients, if we except the Euxine and Palus Mæotis, which bounded it on the south. Its lakes were those of Ladoga and Onega in Finland, unknown to the ancient Sarmatians. Their chief rivers on the south were the Donetz or little Tanais, Borysthenes or Dnieper, Bog, Tyras or Dneister, and the Ister or Danube, all which discharged themselves into the Euxine; and on the north-east the Great and Little Dwina, which run, the first into the White sea, and the other into the gulf of Finland, and therefore unknown to the ancients; and on the west the Vistula, which flowed into the Scythian sea, and divided Sarmatia from Germany.

The whole extent, therefore, of both Scythias, including the two Sarmatias, reached in longitude from the 20th to the 85th degree, or even beyond, and from the Alps to

the promontory of Tabis, and straits of Anian; and in latitude, from Caucasus to the Arctic circle, above 28 degrees. Herodotus indeed says, that the Hyperboreans were not of Scythian race, but another kind of people, some of whom were Androphagi, or men-eaters, fierce and cruel; and others, viz. the Bald-heads, or Argrippeans, a wife and peaceable people, esteemed sacred by all their neighbours: but he speaks of them merely by report, and with diffidence; so that these regions were probably then unknown, if not uninhabited. The five cities of Scythia, which we have mentioned, were probably built after the time of Herodotus, who takes no notice of any metropolis; though he mentions a considerable branch of Scythians, called Royal Scythians, whom he places along the banks of the Tanais; this river, as he says, dividing them from the Asiatic Sarmatians. The original Scythians of Herodotus (l. iv.) were confined, by the Danube and the Palus Mæotis, within a square of 4000 stadia (400 Roman miles). Diodorus Siculus (vol. i. l. ii. p. 155. ed. Wessel.) has marked the gradual progress of the name and nation. From the mouth of the Danube to the sea of Japan (says Gibbon, vol. iv.), the whole longitude of Scythia is about 110 degrees, which, in that parallel, are equal to more than 5000 miles. The latitude of these extensive deserts cannot be so easily or so accurately ascertained; but from the 40th degree, which touches the wall of China, we may securely advance above 1000 miles to the northward, till our progress is stopped by the excessive cold of Siberia. In that dreary climate, instead of the animated picture of a Tartar camp, the smoke which issues from the earth, or rather from the snow, betrays the subterraneous dwellings of the Tongoufes and the Samoiedes. The want of horses and oxen is imperfectly supplied by the use of rein-deer, and of large dogs; and the conquerors of the earth insensibly degenerate into a race of deformed and diminutive savages, who tremble at the sound of arms. Anc. Un. Hist. vol. iv. See SCYTHIANS and TARTARS.

SCYTHIAN, a word used very often in the old Greek writers on the materia medica, to distinguish the peculiar sort of gum, or other drug, brought from the Scythians.

The Scythian and Indian drugs have been by many supposed different kinds of the same medicine; but this is an error; for it appears very obvious, on comparing the writings of Galen, Aëtius, Ægineta, and other of the later writers among the Greeks, with those of Dioscorides, Theophrastus, and the other old ones, that the words Scythian and Indian mean the same thing, and that what the old writers have called Indian, these have called Scythian.

The meaning of this is, that those things were called Scythian, which were brought from the country of Indoscythia, or that part of Scythia which lay at the mouth of the river Indus; but it is to be observed, that though the later Greek writers mean this by their term Scythian, yet the word is used in a very different sense by the Arabians, Avicenna, Serapion, and others; and that wherever they mention a drug under the name of Scythian, they mean that it comes from the northern parts of Scythia, on the confines of Europe. These authors having understood of this Scythia what the Greek writers have said of the other, have made no small errors in regard to the history of drugs, having given bdellium, and many other gums, the produce of only the Scythia of the Greek medical writers, to the frozen Scythia, before mentioned.

SCYTHIANS, in *Ancient Geography*, the inhabitants of Scythia, considered by some geographical authors as the same people with the Tatars, or, as they are more commonly,

SCYTHIANS.

monly, though erroneously, called, Tartars. (See TARTARS.) With regard to the etymology of the name of Scythians we have many different conjectures. Pliny seems to intimate, that this appellation is derived from Sacai, a people known by a similar name to the Greeks and Persians. Bryant deduces it from Cuthia. Colonel Vallancey traces its origin to words denoting *navigation*: others derive it from the Greek word *σχυρῶς*, which expresses the fierceness of their countenance and natural temper; and others again deduce it from the Teutonic word *schuten* or *shuten*, to *shoot*, in which art this nation is said by Herodotus, Lucian, and others, to be so expert, that the name is given them on that account, the word Scythian properly signifying a great *shooter* or *archer*. As the Tartars and Muscovites called themselves Mogli, supposed to be an abbreviation of Magogli, the sons of Magog; that of Scythian might be either given to them by other nations, or perhaps by the Celtes, whose language did not originally much differ from the Scythian or Teutonic. Sir William Jones observes, that neither Scythian nor Tartar is a name by which the people now under our consideration have ever distinguished themselves.

The Scythians have been considered by some writers, with regard to their antiquity and origin, as the same people with the Gomerians, and as being the descendants of Gomer, the eldest son of Japhet. To this purpose Herodotus, Ptolemy, and Justin have called the Scythians, who emigrated into Asia, by some names, and attributed some actions and places to them, which, upon closer examination, are found to have belonged to the Celtes or Gomerians, whom they had driven out of their European territories. Strabo informs us, that the old Greek historians gave the name of Scythians and Celto-Scythians to all the inhabitants of the northern regions, though it is plain that many of them were properly Celtes or Gomerians. And he also adds, that some of those people who inhabited beyond the Caspian sea, which should be the Scythians, were, by the same Greek historians, called Sacæ, and others Massagetæ, though the former of these names, at least, belonged only to the Celtes. Hence many learned men have chosen to reckon them as one people, branched out into that variety of names and characters, under which they are distinguished in history. See CELTES.

Josephus, who affirms the Scythians to be descended from Magog, the next brother of Gomer, has been followed by many of the fathers, and by many moderns, because they could find no better authority. In the migration of these ancient tribes into Europe, if Gomer's descendants turned towards the N.W., those of Magog may be reasonably supposed to have spread themselves towards the N.E. into both Scythias, where we find the ancient Muscovites or Tartarians; distinguished by the name of Mogli, corrupted or abbreviated possibly from Magogli, the sons of Magog. To these conjectures it may be added, that there is scarcely a nation under heaven, that so fully answers the fierce and dreadful character which the Scriptures give us of Gog and Magog, as that of the barbarous Scythians; though in fact this character was too applicable to their neighbours in those early ages.

Sir Isaac Newton is of opinion, that both the Celtes and Scythians had spread themselves over Lesser Asia and Europe, before the year of the flood 1220, that is, about the latter period of the Israelitish judges. How soon the Scythians began to establish a regular government, and what kind of government it was, it is impossible even to conjecture. It appears, however, from the testimony of

Herodotus, that one or two tribes at least, that is, the royal and free Scythians, were under a kind of monarchy, and that these two distinguished themselves more than all the others. Herodotus informs us, that in process of time, when the Scythians were likely to be invaded by Darius, their king, dreading the invader, invited all the Scythian princes, viz. those of the Taurians, Agathyrsians, Neurians, Androphagi, Melanchlaniens, Budians, and Sarmatians, to unite in giving him assistance. All these tribes seem to have been branches of the same stock, but differing much in their manners and customs. In consequence of this application, the three last named nations joined with the king of Scythia, but the others refused to succour him, alleging that he was the first aggressor. Hence we may conclude, that they had emancipated themselves from the yoke of the royal Scythians some time before. As to what the laws of the royal and free Scythians were, we may form some judgment from the excellent character that is given of them by ancient historians. Justin (lib. ii. cap. 2.) gives the following account of them. The Scythians were a nation, which, though inured to labour, fierce in war, and of prodigious strength, could nevertheless so controul their passions, that they made no other use of victories than to increase their fame. Theft among them was reckoned so great a crime, and was so severely punished, that they could let their numerous flocks wander from place to place without danger of losing them. These they esteemed their greatest wealth, living upon their milk, and clothing themselves with their skins. Instead of houses, they used to convey their wives and children about in covered waggons, drawn either by horses or oxen, and made capacious enough to carry all their other furniture. Gold, silver, diamonds, pearls, and other costly stones, were as much despised by them, as they were esteemed by other nations, so that they could not covet that which was of no use. What is still more wonderful, those virtues, which the Greeks in vain endeavoured to attain by learning and philosophy, were natural to them, and they reaped those advantages from their ignorance of vice, which the others could not derive from their knowledge of virtue. A nation of this character and way of life could therefore want but few laws to secure their property; some others they had with relation to religion, customs, and polity, which forbade, under pain of death, any alteration in either; which excluded their women from the benefit of marriage, and every man from assisting at their royal feast, till he had killed an enemy. Some other of their laws we shall have occasion to mention in the sequel. Upon the whole, what appears of them seems wholly calculated to prevent luxury, fraud, and covetousness, and to cherish that martial spirit, for which they are so justly famed in history.

Some of the Scythian tribes, indeed, bear a quite different character, being represented of such fierce and cruel disposition, as even to eat the flesh of their enemies. Those, if under the same government, were at such great distance from the centre of it, as to be out of the reach of its laws. As the inclemency of the air in these remote regions might probably incline them to cruelty; so the distance and barrenness of their country might make them less heeded, and probably more incapable of being restrained by the common regulations of society. However, it must be owned, with respect to the warlike temper even of the true Scythians, that it was not without a mixture of cruelty, if they have not been wilfully misrepresented by the Greek historians.

If we may reason from some successions we find mentioned in history, it seems their crown was hereditary, and

SCYTHIANS.

yet their kings not so despotic as not to be deposed, or even put to death, for the violation of their laws.

When any one of their monarchs fell sick, it was their constant custom to send immediately for three of their most famous prophets, who commonly told him that some Scythian, whom they named, had perjured himself by swearing by the royal throne, which it seems was their most solemn oath. The accused person was thereupon seized, and brought before the king. If he denied the fact, more prophets were sent for; if they confirmed the evidence, the man was immediately beheaded, and his goods were divided among the three first accusers. But if they acquitted him, a new supply of them was to be sent for; and if the majority of them absolved him, then the first accusers were tied hands and feet, and set in a cart loaded with faggots, and drawn by oxen: after they had stooped the false prophet's mouth, as he was then styled, they set fire to the wood, which consumed the cart and man, and seldom failed burning the oxen to death. Our author adds, that the male children of those whom the king condemned to death seldom escaped the same fate.

Another instance of their great respect to their monarchs is the pompous solemnity of their funerals, which was performed as follows: the embalmers received the body covered with wax, they opened and cleansed the belly, and having filled it with bruised cypress, incense, parsley, and aniseeds, they sewed it up again, and placed the corpse in a chariot, and conveyed it from one tribe to another through all the provinces of the kingdom. Every province, where they received the funeral procession, was obliged to imitate the royal Scythians in their mournful ceremonies, which consisted in cutting off one part of the ear, shaving the head, and piercing the left hand with an arrow; in this guise, they accompanied the hearse to the next province, till it reached that of the Gerrians, which was the remotest in the kingdom, situate along that part of the Borysthenes, where it begins to be navigable. Here the corpse was deposited in a large square hole made in the earth, upon a bed encompassed round with spears, which they covered with timber; and spread a canopy over the whole monument. In the vacant places of it they deposited one of his favourite concubines, his head cook, groom, a waiter, a messenger, some horses, - all strangled, and a number of necessary utensils, and among others some golden cups. Then they threw the earth upon it, so as to raise a high mound, or artificial mountain. As soon as the year was expired they chose fifty young men of the king's officers, who were always to be Scythians of quality. These, with an equal number of horses, were strangled, their bowels were taken out, and their bellies stuffed with straw. The bodies of the men were set astride upon the horses, and fastened to them by an iron stake. The horses, thus mounted, were set upon semicircular boards, supported by four pieces of timber, and placed at a convenient distance from each other round the monument, the horses having a loose rein fastened to another post set up for that purpose.

The Scythians worshipped a plurality of gods and goddesses, but that which they reckoned their principal deity was Vesta, whom they called Tabiti. The two next in veneration were Jupiter, whom they called Papeus, and Apia, or the Earth, which they esteemed his wife. Jupiter, it seems, they challenged for their progenitor, and Vesta for their queen, as appears by the answer which one of their kings sent to Darius, when he came to subdue them to his empire; besides these, they worshipped Apollo, the celestial Venus, and Neptune, under the names of Oetofyrus, Strippasa, and Thamimafades. But their favourite

deity seems to have been the god of war, to whom alone they dedicated temples, altars, and images. How his temples were built, Herodotus doth not tell us; neither is it easy for us to guess. It doth not even appear from any ancient authors, or other monuments, that ever they built any properly so called. Groves indeed they were famous for erecting to this deity. In these they affected to have one or more oaks of a mighty size, which were accounted so sacred, that to lop so much as a branch or sprig, or even to wound the bark, was accounted sacrilege, and punished with death. These oaks they never failed to sprinkle plentifully with the blood of their victims, inasmuch, that the rind of some of the oldest of them was covered or even encrusted with it. We are therefore inclined to believe, that Herodotus, who learned these things by report, might, for want of a good interpreter, mistake them for temples, and suppose them to be built like those of other nations.

Besides the deities above named, we are told that some of them worshipped fire as the principle of all things, and gave it the name of Vulcan; they used to swear by the wind, and the sword, the one as the author of life, and the other of death. They likewise looked upon Zamolxis as a deity, to whom they committed the souls of the dead, and offered sacrifices on their behalf. The royal Scythians are affirmed by Herodotus to have acknowledged all the deities above named, and to have offered sacrifices to Neptune in particular; for all these various deities they had not, indeed, temples, but altars and groves, and a set of priests appropriated to each.

How spacious those groves must have been, may be seen in the last quoted antiquarian, or be guessed at by the vast extent of the altars, which Herodotus tells us they erected in them to Mars, their favourite deity, one of which at least they were obliged to have in every district. It was made of small wood tied up into bundles, and covered three stadia of land in length and breadth, though it was not proportionable in its height. The top of it, which was quadrangular, had three sides perpendicular; and the fourth had a gradual declivity, to render the top of it easy of access. One hundred and fifty loads of faggots were to be brought yearly to each altar, to supply those which had been decayed by the inclemency of the winter. On the top of each of those heaps was erected an old iron scimitar, which stood there as the image, or rather emblem of the deity. To him, besides all other cattle, in common with their other gods, and in much greater number, they sacrificed horses; and what was more shocking, every hundredth man they took prisoner from their enemies. The priest having poured a libation of wine upon the captive's head, cut his throat, and received his blood into a bowl, with which ascending to the top of the altar, he washed the deity's sword. As to the victim, they only cut off his right arm close to the shoulder, and throwing it up into the air, left it exposed in the place where it fell, and the rest of the body in that where it was killed.

Of the victims which they sacrificed to Mars or to any other deity, the horse was esteemed the noblest, and the most acceptable. As for swine they detested them, and would not suffer any to remain among them. They also offered to their gods the first fruits of the earth, the firstlings of their cattle, and a part of the spoil they took in war; sending a considerable part of the latter to the Delphic Apollo, by a number of their honourable virgins, under a sufficient escort.

Their alliances and contracts were ratified with the following ceremonies: they poured some wine into an earthen vessel,

SCYTHIANS.

vessel, into which the contracting parties were to mingle some of their own blood, which they drew by a slight incision made in the finger, hand, or some other part of the body. They then dipped into the mixture the point of some warlike weapon, such as a scimitar, arrow, dart, javelin, or battle-ax. The parties then uttered some dire imprecations on the first breaker of the covenant, and, having each of them taken a draught of the liquor, they desired some of the most considerable among the bystanders to pledge them, and to be witnesses of the contract, which was reckoned so sacred, that they thought no punishment severe enough, either in this life or in the next, for those by whom it should be violated.

Their warlike temper and exploits were sufficiently known to the ancients; scarcely is there any nation to be met with in history, so famous for conquering wherever they carried their arms, even as auxiliaries, and themselves remaining still unconquered. Their frugal and simple manner of life, may indeed be supposed to have been a great preservative against such invasions, as other more opulent and luxurious nations were exposed to. But it is plain, this was not always the case, since we find they were once invaded by the king of Persia at the head of a most puissant army, from the power of which nothing but their valour and policy could have delivered them. Upon the whole, such were their strength and courage, whenever they entered into an offensive or defensive war, that, as Thucydides himself tells us, no nation, either in Europe or Asia, could equal them either for strength, valour, or conduct; nor could any thing resist their power, when they were unanimous among themselves.

Such care they took to cultivate this martial genius, that even their women were inured to it betimes, inasmuch that no woman could be admitted into matrimony till she had killed at least one enemy with her own hands. As for their youth, they were not without considerable encouragements to inspire them with martial valour, or rather ferocity, if we may rely upon the information of Herodotus, who tells us that they were wont to drink the blood of the first prisoner they took, and to present the heads of all the men they killed in fight to their monarch; these were either returned or registered, and the warrior enjoyed privileges in proportion to the numbers he had slain. They used to take the skins of the slain, to stretch, dry, and tan them, and then hang them at their horses' bridles, where they served both for trophies and napkins to the owner; he being always most esteemed, who had the greatest number to display. Their pride, or rather barbarity, went so far, that they took off and dressed the whole skin of the slain, and covered both their quivers and horses, and sometimes decked their own bodies with them; and used their skulls for drinking cups.

Had they only exercised this kind of savage pride against those who came to invade them, it might indeed admit of some excuse; but it doth not appear that they gave much better quarter to those whose territories they invaded.

In consequence of their living free from ambition and care, and eating plentifully of animal food, they acquired ruddy complexions, and became so plump and sanguine, that, to prevent their growing too unwieldy, they not only used a great deal of exercise, but even cauterized their arms, shoulders, backs, and breasts, with a view to draw off superfluous moisture. They were remarkable for their fidelity and friendship, which they esteemed and gloried in above all things. They commonly confirmed their friendship by some such religious ceremony or oath, as we have lately mentioned, but a Scythian seldom diffused his attach-

ments to more than two or three individuals, esteeming it very difficult, if not impossible, to keep it inviolate with a greater number. And when such a friendship was once contracted, there was no danger or death which they would not expose themselves to for one another.

They were not more disposed to friendship, than addicted to resentment and revenge. If a man had received an injury, which he was not in a capacity to retaliate, the custom was for him to sacrifice a bullock, and to roast the flesh of it in small pieces. Then he spread the hide upon the ground, and sat upon it, holding his hands down behind him as if they had been tied; upon which signal all that beheld him, whether friends, relations, or strangers, came to inform themselves about the injury and injurer, and if they favoured his cause, took up a piece of the meat, setting their feet upon the hide at the same time, promising assistance accordingly; one perhaps sent him five men and horses, another ten, more or less, according to their circumstances, or the nature of the injury.

How populous the Scythians were, we have not been able to discover. If it be allowed that they made frequent and bloody inroads one upon another, we cannot but suppose that it must have lessened their numbers exceedingly. On the other hand, if we consider their plain and laborious way of living, their climate, constant exercise, and other advantageous circumstances, which rendered them hardy and strong, prolific and long lived, we can hardly conceive they could be other than a populous nation: for we are told, that very few died of sickness, but that in general they lived to a good old age, inasmuch, that many of them being weary of the world, before death took them out of it, it was usual with such to hasten their exit by throwing themselves from an eminence into the sea, or into some river. Herodotus, however, who seems in doubt whether they were so populous as some, or so thin as others represent them, gives us an authentic instance and monument in favour of the former, which is as follows: they had, it seems, a custom, not uncommon to other nations, at their first taking of the field to muster their fighting men, and to make every man cast an arrow into a proper receptacle, which at their return from the expedition was again taken up. By this expedient they could easily compute not only the number of their men, but also that of their slain, or of those who either deserted, or absented themselves from the war. It was at some such muster as this, that one of their kings, whom Herodotus names Ariantes, being present, and observing these heads of arrows to amount to an immense bulk and weight, as he had indeed a prodigious army under him, ordered them to be melted and cast, and made a large capacious vessel, which our author tells us was still extant in his time; and, though full six inches thick, was large enough to hold six hundred amphoras, that is about fifty hogshheads, and remained a monument of this prodigious army. What seems to be a stronger argument of their being populous, is, the succession of colonies which they sent out, chiefly towards the southern parts of the world.

The Scythians cultivated no arts or sciences, except that of war, nor did they pay much attention to trade or commerce, or any species of agriculture except pasturage. Their mode of living was altogether incompatible with commerce. They do not seem to have known any thing of writing, until they brought it with them from Asia, after their twenty-eight years' invasion of that country.

Their language is very much unknown to us; but the extent of their territories and their intercourse, and intermixing with various other nations, must occasion a great number

number of dialects, from which most probably have sprung the Muscovitish, Slavonic, Polish, Danish, Swedish, Saxon, and many others; between which one can but barely discover affinity enough to evince their origin from the same mother. A great number of words and phrases that are found not only in those northern languages, but also in the Latin, Greek, Arabic, and Persian, shew them to have been so many dialects of the old Celtic. If those few relics of the Scythian, which we have left in the names of their kings, tribes, and districts, do not so plainly appear to be of the same extraction, we must remember they have passed through so many different hands, and have so often changed their dress, especially among the Greeks, that they may be easily supposed to have quite lost their ancient form. We may add, that some of them are perfectly Greek, or translated from the Scythian into that language. Of this kind is the name of the Oœnes, a Scythian tribe, so called in Herodotus, from their living upon the eggs of wild-fowl, and derived from the Greek *ων*. The Nomades were so called from *νομα*, *pasture*. Of the same extraction were the Hyppodes, Androphagi, and some others.

Their chief manufactures seem to have consisted mostly in building waggons for their families and baggage, which being covered with the skins of beasts, shews that they must have had some notion of tanning and dressing leather. We may likewise reasonably suppose, that they fabricated their own weapons, which were scimitars, javelins, axes, but especially bows and arrows, at which they are said to be so expert, that their very children were trained to shoot at a mark, even as they rode on horseback; inasmuch that it became a common proverb, "that the Scythians were as dextrous at their bows as the Greeks were at their lyre." Hence Cyaxares, king of Media, is reported to have sent his son to be brought up under them, to learn the use of the bow. They were so expert in horsemanship, as to have acquired the epithet of *ἵπποβοτοί* by Herodotus and Lucian. Their women are affirmed to have been so well trained to riding and shooting, that they did not fall short of the men in those exercises. The ancients observe, that they had neither mules nor asses; and the reason they give is, that the country was too cold for those creatures. Experience has since shewn the contrary, at least with respect to the latter; but the true reason seems to be, that the horses, which they bred in great numbers, could answer all the purposes of the other two species, and at the same time be more swift and expeditious.

As for agriculture, it doth not appear that they had any. Herodotus indeed tells us of one province, whose inhabitants called themselves Olbiopolitans, and the Greeks Borysthenians, as they lived on the north side of that river; and these he likewise called husbandmen, because they sowed grain, not for food, but for sale. But the rest of the Scythians wholly neglected it, chusing rather to roam where they found the best pasture for their cattle, and contenting themselves with the spontaneous products of the earth, without being at the trouble of manuring it. And this is in all likelihood the cause why we read of so many deserts, forests, and large uninhabited tracts of land between tribe and tribe, in the writings of ancient historians and geographers. How they disposed of the wool of their flocks we know not, but, by their clothing themselves with the skins of wild or tame beasts, we may conclude they did not manufacture it into cloth; and as those skins were of their own dressing, they wanted still less the help of foreign manufacturers. Smiths they must have had, for making their arms, waggons, and other necessary tools. As to their arrows, darts, and javelins, if their heads were

made of copper, they were probably cast in moulds. They used standards of a particular make, which, when blown open by the wind, exhibited the figures of serpents and dragons of several shapes, and these were commonly borne by men on horseback.

Their chief riches and food consisting in their numerous herds, they entrusted the care of them to shepherds, who were a lower rank of Scythians, below the martial men, though they too had slaves and captives in their service. They used to move from pasture to pasture, with the persons and families which were unfit to go to the wars. These chiefly lived upon honey, cheese, and milk, more especially that of their mares, from which creature, if Herodotus was rightly informed, they had a strange way of forcing plenty of it, by blowing wind into the privities; but their chief and choicest food was the venison they killed. What provisions the warlike Scythians made, when they were absent from their flocks, we cannot guess; it is probable when they came into an enemy's country, they seized upon all the cattle they could meet with; and when that failed, they had recourse to a composition they carried about them, of which we shall speak presently.

From an instance or two recorded of their kings, we conclude, they allowed of polygamy, and were not over-strict in their marriages. Plato seems even to intimate that they had their women in common, though, if any such custom prevailed among them, it must have been only among the more savage sort, for the royal and free men had wives; and some of their kings we read of, who took them from other nations, and of one of them who married his own father's widow; but whether the same liberty was allowed to private men we cannot affirm. The reason the Scythians gave for abhorring the Bacchanalian feasts of the Greeks, namely, that it was absurd to suppose, that a god should drive men to all the violent transports of madness, seems to shew that drunkenness was not common among them. And indeed we do not find that they were much addicted to feasting. Plutarch, in his Banquet of the Seven Wise Men, says, "that they neither had vines, nor players on instruments, nor public games." One wine-feast they kept however once a-year in every district, for those who had signalized themselves by killing one or more of their enemies. Another we read of, which was used at funerals. Some others they might have upon other occasions not worth enquiring after; but in general, they were remarkably abstemious, except in their affections for their favourite women. They talked little, but concisely and nervously, especially about their warlike affairs. They commonly travelled on horseback, or in their domestic vehicles. When they had any rivers to cross, they laid their horse's saddle and weapons upon a skin filled with cork, and so well sewn, that not a drop of water could get into it; they then laid themselves down on it, and taking hold of their horse by the tail, made him swim to the other side. They carried with them a certain composition, in small pieces like pills, one of which, upon occasion, would yet afford sufficient nourishment for several days. Pliny adds, that they used the like expedient with their horses, by means of what he calls the Scythian weed, upon the strength of which they could travel ten or twelve days without eating or drinking.

When any person died, his nearest relations caused his embalmed body to be carried in a chariot from house to house among his friends and acquaintance, who received and feasted them in their turns, setting part of the banquet before the deceased. This ceremony was continued forty days, after which the person was buried, and his at-

SCYTHIANS.

tendants purified themselves, not by any ablution, but by the smoke of some hemp-seed peculiar to the country, which being thrown upon burning stones, emitted a much more agreeable perfume than the frankincense used in Greece, and intoxicated the company, who concluded the ceremony with hideous shrieks. This served instead of washing, which the Scythians never practised; not even the women, who used instead of it to anoint their bodies and face with a paste, made of cypress, cedar, and frankincense, ground upon a rough stone, and soaked in water, which paste being taken off next day, rendered their skins clean, shining, and sweet.

Hitherto we have confined our chief attention to the royal Scythians; but there were other tribes or petty kingdoms that demand some transient notice.

The Samaritans are affirmed by Herodotus to have been the offspring of the Scythians and Amazons. These warlike women, or as their Scythian name, Aior Patta, imports, *man-slayers*, in their flight from the Grecians, having landed near the precipices of the Palus Mæotis belonging to the free Scythians, and having been persuaded to be married to them, did in their turn prevail upon them to leave that part of Scythia, where they pretended they could not conveniently live with them, and to pass into the province of Sarmatia on the other side of the Tanais. Hence, our author says, the Samaritan women retained still the Amazonian temper and way of life, being more warlike than the rest of the Scythian females, and the language of the country became a corrupt Scythian, because the Amazons never could perfectly learn that language, but taught it their offspring, corrupt as themselves spoke it. Here it chiefly was, that a virgin was unqualified for matrimony, till she had dispatched an enemy in the field.

The Taurians had this inhuman custom, that they sacrificed to a virgin all that were shipwrecked, and all the Grecians whom they caught upon their coasts. This bloody offering was performed by knocking the person on the head with a club, after many dire imprecations, and flinging his carcase down the hill on which their temple was built, or as others told our author, by burying the body, and reserving only the head to be stuck on a pole. These Taurians pretended, that the virgin dæmon whom they thus worshipped, was Iphigenia, Agamemnon's daughter. They lived chiefly by war and rapine, and were very cruel to those that fell into their hands. The Agathyrsians are said to have had their women in common, in order to link the men more strictly together, and to prevent jealousies, and other ill effects of matrimony. The Neurian province being infested with dangerous serpents, they were at length forced to leave it for that of the Budians. They observed the customs of Scythia in most particulars, only pretended to greater skill in magic than they, and were reported to be transformed into wolves for some part of the year, after which metamorphosis, they resumed their own shape; an allegory which is supposed to mean no more than their wearing of skins with the fur outward during the cold weather. The Neuriens are mentioned also by Pliny, Mela, and Steph. of Byzantium.

The worst of all were the Androphagi, or men-eaters, who observed neither laws nor justice, and had nothing in common with the rest, but their dress and occupation of breeding cattle. The Melanchœneans were so called for affecting to go always in black; they followed the Scythian customs, except that they fed upon human flesh, which the free Scythians did not; nor indeed did any other tribes use it, at least as common food, but only on some particular occasions. The Budians were a populous nation,

famed for blue eyes, and red hair: in this province, above all the rest, did they build them a city, and called it Gelonus, whose houses and high walls were of timber, and each side of the walls was three hundred stadia in length; it had temples and chapels dedicated to the Grecian gods; and here they celebrated the Bacchanalia triennially. The people of the province differed from those in the city, in that the former applied themselves to the keeping of cattle, and these to tillage and planting gardens, living upon the products of them, and of their corn fields; in a word, these Gelonians were so much more civilized in their manners than the Budians, that they seemed quite another people. They are supposed to have been of Greek extract, and to have been in time quite blended with the Budians, who were of Sarmatian origin, and contiguous to them; and Herodotus observes, that each preserved their own native language. The Gelonians learned, among other things, the custom of painting their bodies from the Sarmatians, whence that verse in Virgil's Georgics, xii. v. 115.

“Eosque domos Arabum pictosque Gelonos.”

This province abounded with otters and beavers, which afforded skins for wearing, and castor for medicine.

The last two nations or tribes of the Scythians worth our notice, were the Nomades, inhabiting the country on the north-west of the Caspian sea, and the Massagetes on the west. For an account of the AMAZONS, we refer to that article. The Nomades differed so little from the royal Scythians, except in this appellation, that it is needless to say more concerning them, than that they led a wandering life, living no longer in one place than they found plenty of pasture for their cattle; which being consumed, they removed to fresh grounds; and, when called to the wars, left their families and flocks, with their shepherds, till their return. Pliny places them on the left side of the Caspian sea, and says the river Panticapes parted them from the Georgii. Strabo adds, that they lived in waggons instead of houses. (See NOMADES.) For an account of the Massagetæ, see MASSAGETES.

The following table exhibits the names and succession of Scythian kings:

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| 1. Scythes. | 12. Panaxagoras. |
| 2. Napis. | 13. Tanais. |
| 3. Phithra. | 14. Saulius. |
| 4. Sagillus, or Protothyas. | 15. Spargapifes. |
| 5. Madyes. | 16. Aripithes. |
| 6. Thomyris. | 17. Scyles. |
| 7. Jancirus. | 18. Octamafades. |
| 8. Indathyrfus. | 19. Ariantes. |
| 9. Targitaus. | 20. Atheas. |
| 10. Calaxais. | 21. Lambinus. |
| 11. Scholypethes, or perhaps rather Scythopetes. | |

Madyes was a warlike prince, and it was under his conduct that the Scythians, having driven the Cimmerians, or northern Celtes, out of Europe, and pursued them into Asia, invaded the country of the Medes, and held the greater part of Upper Asia in subjection for twenty-eight years. As Scythia did not afford a sufficient supply of food for its numerous inhabitants, they discharged the superfluous multitudes towards the more fertile south; and having rapidly passed into Asia, their victorious army was led into Egypt. Here they made some incursions into the land of the Philistines; and in this expedition they are said to have taken the city of Bêthshean from the tribe of Manasseh, on this side of Jordan, and to have called it, after their own name, Scythopolis,

Scythopolis, or the city of the Scythians. In their return to Syria, some of them plundered the temple of Venus at Afcalon, and for their sacrilege were punished with a kind of flux of blood, common to the female sex, which descended to their posterity as a mark of infamy. Thomyris, or Tomyris, was that heroine whom, we are told by Herodotus, Cyrus the Great demanded in marriage. Indathyrus was the magnanimous prince who, having received from Darius, the Persian king, the proud challenge implied in the demand of earth and water as a token of subjection, sent him this remarkable reply; that as he acknowledged no lord but his progenitor Jupiter, and Vesta, queen of the Scythians, he would shortly send him a more suitable present, such as might, perhaps, make him repent of his arrogance. This present, consisting of a bird, a mouse, a frog, and five arrows, was afterwards dispatched to him, without any application. Gobrias explained to Darius the meaning of this present, which the king had understood to be a token of submission, intimating that the Persians must not hope to avoid the effects of Scythian valour, unless they could either fly like birds, plunge under water like frogs, or bury themselves in the earth like mice. The Persian monarch invaded the Scythian territory; but the result of the expedition was that he was forced to retire with the loss of the greatest part of his numerous army, and glad to escape with his own life, though at the expence of his glory. Saulius was the king of Scythia, who slew *Anacharfis*. See his article. The last king of Scythia, according to Justin, was Lambinus. For further particulars relating to the Scythians, we refer to Herodotus, Diodorus Siculus, Justin, Mela, Anc. Univ. Hist. vol. iv.; Gibbon's Hist. of the Decl. &c. of Roman Emp. vols. i. iv. v. vi.; and sir W. Jones's Fifth Discourse, apud Works, vol. iii. or As. Researches, vol. ii. See also CELTS, GETÆ, GOTHs, HUNS, SARMATIANS, SAXONS, SCANDINAVIA, and VANDALS.

SCYTHICUM LIGNUM, in *Botany*, a name given by the ancients to a tree called *scytharion* by the later writers of the Greeks.

SCYTHOPOLIS, in *Ancient Geography*, a town of Syria, in a province called Decapolis.

SCYTHRANUS PORTUS, a port of Africa, in Mar-marica, between Antipyrgus and the Catæonium Promontorium, according to Ptolemy.

SCYTHROPS, in *Ornithology*, a genus of birds of the order Picæ. The generic character is, bill large, convex, sharp-edged, channelled at the sides, hooked at the point; nostrils naked, rounded at the base of the bill; the tongue is cartilaginous, split at the point; the feet are formed for climbing. This genus, of which only a single species is known, is nearly allied to the *Ramphastos*, from which it principally differs in the greater strength and stoutness of the bill, and in having the tongue entire at the sides, and bifid at the tip.

Species.

PSITTACEUS. This bird has obtained different trivial names. From the circumstance that it is found in New Holland; where, by the way, it is sometimes seen in small flocks, but more frequently in pairs, generally in trees, and uttering, during flight, a loud screaming noise, not unlike the crowing of a cock; it is called by some the Australasian Channel-bird; by others, the New Holland Channel-bird; and by some, Psittaceous Hornbill. By Dr. Shaw, it is specifically described as the lead-coloured channel-bill, with the tail-feathers barred with black and white. It is about the size of a crow, and measures in total length about seventeen inches, of which the bill measures four inches. The general

proportions of the bird somewhat resemble those of the cuckoo, but with a longer and more cuneated tail. The colour of the upper parts of the body, wings, and tail, is deep blueish ash-brown, the tips of the feathers somewhat more intense than the rest; the head, neck, and under parts of the bird, are of a pale grey, or dove-colour; the two middle tail-feathers have a black bar near the tip, which is white; all the remaining tail-feathers are ash-brown externally, but on the inner webs are white, crossed by numerous black bars, and marked, like the middle ones, by a broader black bar near the end, the tips being white; the eyes and nostrils are seated in a reddish naked skin; the bill and legs are of a pale yellow, the former are marked on the upper mandible by a longitudinal dusky streak or two, and on the lower by three or four dusky bars near the base. Dr. Shaw has given a figure of this bird, but it may be doubted whether, with respect to magnitude, it is calculated to convey just ideas of the bird itself.

SCZEBRZESZIN, in *Geography*, a town of Austrian Poland, in Galicia; 5 miles W. of Zamoscie.

SCZEZEDROHORST, a town of Lithuania; 60 miles S.E. of Brzesc.

SCZUCZYN, a town of Poland; 35 miles S.W. of Sandomirz.

SDUR, a town of Arabia, in the province of Hedsjas; 20 miles S.S.E. of Suez.

SE, or TSE, a city of China, of the second rank, in Honan. N. lat. $36^{\circ} 25'$. E. long. $114^{\circ} 14'$.

SE, *Felo de*. See FELO.

SE, *Per*. See PER *se*.

SEA, *Mare*, in *Geography*, is frequently used for that vast tract of water encompassing the whole earth, more properly called *Ocean*; which see.

For the cause of the saltness of the sea, see SALTNESS.

SEA is more properly used for a particular part or division of the ocean, denominated from the countries it washes, or from other circumstances.

Thus we say the *Iris* sea, the *Mediterranean* sea, the *Baltic* sea, the *Red* sea, &c. which see respectively.

Till the time of the emperor Justinian, the sea was common and open to all men; whence it is that the Roman laws grant an action against a person who shall prevent or molest another in the free navigation or fishing therein.

The emperor Leo, in his fifty-sixth novel, first allowed such as were in possession of the lands, the sole privilege of fishing before their respective territories, exclusive of all others; he even gave a particular commission to certain persons to divide the Thracian Bosphorus among them.

From that time, the sovereign princes have been endeavouring to appropriate the sea, and to withdraw it from the public use. The republic of Venice pretends to be so far mistress in her gulf, that there is a formal marriage every year between that signory and the Adriatic.

To confirm this right, those who contend for it have alleged the example of Uladislaus, king of Naples, and the emperor Frederic III. and of some of the kings of Hungary, who requested the Venetians to permit them to pass through that sea with their vessels. That the empire belongs to the republic to a certain distance from the coast, in the places of which it can keep possession, and which it is of importance to hold in regard to its own safety, appears, says Vattel, to be incontestable; but he very much doubts, whether any power is at present disposed to acknowledge her sovereignty over the whole Adriatic sea.

In these last ages, the English have particularly claimed the empire of the sea in the Channel, and even that of all the seas encompassing the three kingdoms of England, Scotland, and

Ireland, and that as far as the shores of the neighbouring states. In consequence of which pretension it is, that children born in these seas are declared natural Englishmen, as much as if born on English ground. The justice of this pretension is strenuously argued between Grotius and Selden, in the *Mare liberum*, and *Mare clausum*.

The use of the open sea consists in navigation and fishing; along its coasts it is likewise of use for the procuring of several things found near the shore, such as shell-fish, amber, pearls, &c. for making of salt, and, in short, for the establishment of places of retreat and security for vessels. The open sea is in its own nature not to be exclusively possessed, as no one is able to settle there so as to hinder others from passing. But a nation powerful at sea may forbid others to navigate it and to fish in it, declaring that it appropriates its dominions to itself, and that it will destroy the vessels that shall dare to appear in it, without its permission. Vattel, a highly approved writer on this subject, investigates its right to do this. It is evident, in the first place, that nobody has a right to appropriate to himself the use of the open sea: for he who navigates or fishes in it does no injury to any one, and the sea, in both these respects, is sufficient for all mankind. Nor does Nature give to any man a right of appropriating to himself things that may be innocently used, and that are inexhaustible, and sufficient for all; since, every one being able to find in their state of communion what was sufficient to supply their wants, to undertake to render themselves sole masters of them, and to exclude all others, would be to deprive them, without reason, of the benefits of nature. Although the law of nature approves the rights of dominion and property, which put an end to the primitive manner of living in common, this reason could not take place with regard to things in themselves inexhaustible, which cannot therefore be justly appropriated.

If the free and common use of a thing of this nature was prejudicial or dangerous to a nation, the care of its own safety authorized it to submit, if possible, that thing to its dominion in order to permit the use of it, with such precautions as prudence should direct. But this is not the case with the open sea, in which people may sail and fish without the least prejudice to any person, and without putting any other people in danger. No nation then has a right to lay claim to the open sea, or to attribute the use of it to itself to the exclusion of others. The kings of Portugal have formerly arrogated to themselves the empire of the seas of Guinea and the East Indies; but the other maritime powers gave themselves little trouble about such a pretension. The right of navigating and fishing in the open sea being then a right common to all men, the nation which attempts to exclude another from that advantage does it an injury, and gives a sufficient cause for war: nature authorizing a nation to repel an injury; that is, to make use of force against any one who would deprive it of its rights. Besides, a nation which, without a title, would arrogate to itself an exclusive right to the sea, and support it by force, does an injury to all nations whose common right it violates; and all are at liberty to unite against it, in order to repress such an attempt. However, as each has the liberty of renouncing its rights, a nation may acquire exclusive rights of navigation and fishing by treaties, in which other nations renounced, in its favour, the right they derive from nature. These are obliged to observe their treaties, and the nation they have favoured has a right to maintain by force the possession of its advantages. Thus, the House of Austria has renounced, in favour of England and Holland, the right of sending vessels from the Netherlands to the East Indies. Many examples of like treaties may be found in Grotius, "*De Jure Belli et Pacis*,"

lib. ii. cap. iii. § 15. The rights of navigation, fishing, and others that may be exercised on the sea, are imprescriptible; they cannot be lost for want of use; consequently, when a nation finds that itself alone has from time immemorial been in the possession of a navigation or fishery in certain seas, it cannot, on this foundation, attribute to itself an exclusive right to them. But it may happen, that a want of use may be attended with the nature of a consent, or a tacit pact, and thus become a title in favour of one nation against another. When a nation in the possession of the navigation and fishery in certain latitudes, pretends an exclusive right, and forbids any other interfering in it; if these obey that prohibition with sufficient marks of acquiescence, they tacitly renounce their right in favour of the other, and establish a right which the other may afterwards lawfully maintain against them, especially when it is confirmed by long use.

Nevertheless, the sea near the coasts may become property; so that the nation to which the coasts belong may appropriate to itself an advantage which it is considered as having taken possession of, and made a profit of it, in the same manner as it may possess the domain of the land which it inhabits. But if, so far from taking possession of it, it has once acknowledged the common right of other nations to come and fish there, it can no longer exclude them from it; it has left that fishery in its primitive freedom, at least, with respect to those who have been in possession of it. The English not having taken the advantage from the beginning of the herring fishery on their coast, it is become common to them with other nations.

A nation may likewise appropriate things, where the free and common use of them would be prejudicial and dangerous. This is a second reason for which powers extend their dominions over the sea along their coast, as far as they are able to protect their right. It concerns their safety and the welfare of the state, that the whole world be not permitted to come so near their possession, especially with men of war, as to hinder the approach of trading nations, and disturb navigation. These contiguous parts of the sea, thus subject to a state, are comprehended in its territory; nor can any one navigate them in spite of that nation. But it cannot refuse access to vessels not suspected, for innocent uses, without violating its duty; every proprietor being obliged to grant a passage to strangers, even by land, when it may be done without damage or danger.

It is not easy to determine to what distance a nation may extend its rights over the sea by which it is surrounded. Bodinus pretends that, according to the common right of all maritime nations, the prince's dominion extends even thirty leagues from the coast. But this exact determination can only be founded in a general consent of nations, which it would be difficult to prove; each state may, in this respect, ordain what it shall think best, in relation to what concerns the citizens themselves, or their affairs with the sovereign; but between nation and nation, all that can be reasonably said is, that, in general, the dominion of the state over the neighbouring sea extends as far as is necessary for its safety, and it can render it respected; since, on the one hand, it can only appropriate to itself a thing that is common, as the sea, so far as it has need of it, for some lawful end; and, as to the other, it would be a vain and ridiculous pretension to claim a right that it was no ways able to cause to be respected. The fleets of England have given room to its kings to attribute to themselves the empire of the seas which surround that island, even as far as the opposite coasts. (See Selden's "*Mare Clausum*.") Selden relates a solemn act, by which it appears that this empire, in the time of Edward I., was

acknowledged by the greatest part of the maritime nations of Europe; and the republic of the United Provinces acknowledged it, in the same manner, by the treaty of Breda, in the year 1667, at least so far as related to the honours of the flag. But solidly to establish a right of such extent, it is necessary to shew very clearly the express, or tacit, consent of all the powers concerned. The French have never agreed to this pretension of England, and in the same treaty of Breda just mentioned, Louis XIV. would not even suffer the Channel to be called the English Channel, or the British sea.

The banks of the sea belong incontestibly to the nation that possesses the country of which it is a part. The ports and harbours are manifestly a dependance, and even a part of the country, and consequently are the property of the nation. The same observation is applicable to the bays and straits. With regard to straits in particular, that serve for a communication between two seas, the navigation of which is common to all, or to many nations, he who possesses the strait cannot refuse others a passage through it, provided that passage be innocent, and attended with no danger to the state. Nothing but the care of his own safety can authorize the master of the strait to make use of certain precautions, and to require the formalities commonly established by the custom of nations. He has a right to levy small duties on the vessels that pass, on account of the inconvenience they give him, by obliging him to be on his guard; by the security he affords them in protecting them from their enemies, and keeping of pirates at a distance; and the expence he incurs by maintaining light-houses, sea-marks, and other things necessary to the safety of the mariners. As to the right of wrecks, see WRECK.

If the sea is entirely enclosed by the land of a nation, with only a communication with the ocean by a channel, of which that nation may take possession, it appears that such a sea is no less capable of being occupied and becoming property than the land; and it ought to follow the fate of the country that surrounds it. The Mediterranean was formerly included within the lands of the Romans; and these people, by rendering themselves masters of the strait that joins it to the ocean, might subject it to their empire, and add it to their domain. They did not by these means injure the rights of other nations; a particular sea being manifestly designed by nature for the use of the countries and the people who surround it. Besides, in defending the entrance of the Mediterranean from all suspected vessels, the Romans secured at once the immense extent of their coast; and this reason was sufficient to authorize their possession of it. And as it has an absolute communication with none but their state, they were at liberty to permit or prohibit the entrance into it, in the same manner as into any of their towns and provinces.

When a nation takes possession of certain parts of the sea, it enjoys the empire, as well as the domain. Those parts of the sea are within the jurisdiction of the territory of the nation; the sovereign commands there, he makes laws, and may punish those who violate them; in a word, he has the same rights there as at land, and in general all those given him by the law of the state.

It ought to be observed, however, that a nation may possess as property the domain of a state at land or sea without having the sovereignty; it may happen also that it may have the empire of a place where the property of the domain with respect to use belongs to some other nation. The English have never pretended to have a property in all the seas over which they have claimed the empire. Vattel's Law of Nations, b. i. ch. 23.

The term *sea* is variously applied by sailors, to a single wave, to the agitation produced by a multitude of waves in a tempest, or to their particular progress or direction. Thus they say, a heavy sea broke over our quarter; or, we shipped a heavy sea; there is a great sea in the offing; the sea sets to the southward. Hence a ship is said to head the sea, when her course is opposed to the setting or direction of the surges. A *long sea* implies an uniform and steady motion of long and extensive waves; on the contrary, a *short sea* is when they run irregularly, broken and interrupted, so as frequently to burst over a vessel's side or quarter.

SEA, *General Motion of the*. Mr. Daffie of Paris, in a work published about a century ago, has been at great pains to prove that the sea has a general motion, independent of winds and tides, and of more consequence in navigation than is usually supposed. He affirms that this motion is from east to west, inclining toward the north, when the sun has passed the equinoctial northward, and that during the time the sun is in the northern signs; but the contrary way, after the sun has passed the said equinoctial southward; adding, that when this general motion is changed, the diurnal flux is changed also; whence it happens, that in several places the tide comes in during one part of the year, and goes out during the other, as on the coasts of Norway, in the Indies, at Goa, Cochinchina, &c. where, while the sun is in the summer signs, the sea runs to the shore; when in the winter signs, from it. On the most southern coasts of Tonquin and China, for the six summer months, the diurnal course runs from the north with the ocean; but the sun having repassed the line toward the south, the course declines also southward. Phil. Trans. N° 135.

SEA, *Basin of the, Fundus maris*, a term used by geographers, and other writers, to express the bottom of the sea in general.

Mr. Boyle has published a treatise on this subject, in which he has given an account of its irregularities and various depths, founded on the observations communicated to him by mariners.

The ingenious count Marfigli has, since his time, given us a much fuller account of this part of the globe, mostly from his own experiments in many places, particularly along the coasts of Provence and Languedoc. The entire basin of the sea is of such immense extent, and covered in many places with such an unfathomable depth of water, that it is not to be expected that it can be traced in every part; but as the whole may be guessed at, from some part of it, and as its general figure is of no consequence in a search of this kind, the observations of this curious author are of great value, in forming a judgment of the whole.

The materials which compose the bottom of the sea, may very rationally be supposed, in some degree, to influence the taste of its waters; and Marfigli has made many experiments to prove, that fossil coal, and other bituminous substances which are found in plenty at the bottom of the sea, may communicate in great part its bitterness to it. See SALTNESS.

We are not, however, to judge hastily, that there are not so many beds of these at the bottom of the sea, as would be necessary for such a purpose, or to judge too hastily against the existence of any other substances there, because we do not find proofs of them by the plummet, which in sounding brings up other substances, and not these; for the true bottom of the sea is very often covered and obscured from us by another accidental bottom, formed of various substances mingled together, and often covering it to a considerable depth.

The entire gulf of Lyons, situated between Cape Quiez
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in Rouffillon, and Cape Croisit in Provence, forms a bank above the surface of the water at the shore, of the exact and perfect figure of an arch; and within this there is formed another such arch, making the bottom of the sea in that place for a very great way from shore, which is of different depths in various places, but usually between sixty and seventy fathom. See *Sea-Shore*.

It is a general rule among sailors, and is found to hold true in a great many instances, that the more the shores of any place are steep and high, forming perpendicular cliffs, the more deep the sea is below; and that, on the contrary, level shores denote shallow seas. Thus the deepest part of the Mediterranean is generally allowed to be under the height of Malta. The observation of the strata of earth, and other fossils, on and near the shores, may serve to form a very good judgment as to the materials which are found in its bottom.

The veins of salt and of bitumen doubtless run on the same, and in the same order in which we see them at land; and the strata of rocks, that serve to support the earth of hills and elevated places on shore, serve also, in the same continued chain, to support the immense quantity of water in the basin of the sea. It is probable also, that the veins of metals, and of other mineral substances, which are found in the neighbouring earth, are in the same manner continued into the depths of the sea. The particles of metals in this case, are probably carried off into deep water, and sunk among the softer matter of the bottom, but some of the lighter minerals seem to have given colour to those beautiful crusts, which are found upon many sea substances, and which lose their lustre in the drying. The subterranean rivers, and currents of water, make great changes in what would be the natural surface of the bottom of the sea, where they arise, each having a peculiar basin of its own. We are informed by numerous instances of subterranean currents, and as we see them break out in rivers on the surface of the earth in some parts, so in others we may be well assured that they break up the bottom of the sea, and empty their fresh waters into the salt seas.

In this case, the rushing up continually of such a body of water makes a roundish cavity, and its running some one way, lengthens and carries on that cavity, till by degrees it is lost, as the fresh water by degrees becomes blended with the salt. Thus every river that arises in the bottom of the sea, alters the form of its surface, and makes a basin for itself, in which it runs a considerable way. Many seas near the shore, and when the water is tolerably clear, shew the traces of these currents to the naked eye from the surface, and the water taken up from them is found more or less fresh.

The coral fisheries have given us occasion to observe, that there are many, and those very large caverns, or hollows in the bottom of the sea, especially when it is rocky; and that the like caverns are sometimes found in the perpendicular rocks, which form the steep sides of those fisheries. These caverns are often of great depths, as well as extent, and have sometimes wide mouths, equal to their largest diameter in any part, but sometimes they have only narrow entrances into large and spacious hollows. It is the common opinion of the people about the place, that these caverns are prepared by nature for the circulation of the sea-water; but that operation, however necessary, may be performed as well without, as with these caverns, and they seem in reality to be only accidental.

We daily meet with immense hollows and caverns, naturally made in rocky mountains; and as this part of the bottom of the sea is almost all rock, and its sides of the

same nature, it is no wonder that the same accidents should happen, and like hollows be found, though with no particular intent of Providence in their use. Nay, there is this farther reason to expect them in the rocks buried under the sea than in those in hills, that the latter are in a state of rest and quiet, whereas the former are in continual reach of water, which will insinuate itself into every crack or crevice nature has left in them, and may be easily supposed to have burrowed its way in a small hole made by nature, till it has formed of it a very large one.

From such observations he infers, that the basin of the sea was at the creation, or at its second formation after the universal deluge, covered with or composed of the same substances, as the surface of the rest of the earth is, that is of rocks, clay, and sand, and other such substances. Over these there is an artificial bottom formed of muddy tartareous incrustations, dead weeds, broken shells, and other bodies of the same kind, cemented together into a firm mass or crust; and in those places where this crust has never been formed, or where it has been broken, the bottom of the sea is of the same nature with the strata of the earth.

The bottom of the sea is covered with a variety of matters, such as could not be imagined by any but those who have examined into it, especially in deep water, where the surface only is disturbed by tides and storms, the lower part, and consequently its bed at the bottom, remaining for ages perhaps undisturbed. The soundings, when the plummet first touches ground on approaching the shores, give some ideas of this. The bottom of the plummet is hollowed, and in that hollow there is placed a lump of tallow; this being the bottom of the lead, is what first touches the ground, and the soft nature of this fat receives into it some part of those substances which it meets with at the bottom; this matter, thus brought up, is sometimes pure sand, sometimes a sort of sand made of the fragment of shells, beat to a sort of powder; sometimes it is made of a like powder of the several sorts of corals; and sometimes it is composed of fragments of rocks; but beside these appearances, which are natural enough, and are what might very well be expected, it brings up substances which are of the most beautiful colours.

Things of as fine a scarlet, vermilion, purple, &c. as the finest paint could make them, and as yellow as a solution of gamboge, are common; and sometimes, though not so frequently, the matter brought up is blue, green, or of a pure snowy whiteness. These coloured matters sometimes seem to have made up the whole bottom or mass of the surface, but more usually they have been formed upon other things, as upon the mud, or upon larger pieces of shells, corals, and the like, in the manner of tartareous crusts, and those in some degree resembling the crustaceous coats of some of the sea plants. The colours of these substances are not merely superficial and transient, but many of them are so real and permanent, that they may be received into white wax melted, and poured upon them, or kept in fusion about them; and when thus examined, they seem as if a proper care might make them of great value, as paints of the finer kinds, where little is to be used.

The same coloured matters that thus coat the substances, found at the bottom of the sea in these places, are also sometimes found extended over the surface of marine substances of the harder kind, which are found in deep water. They are always, in this case, in a sort of liquid form, being lodged within, or embodied among a sort of jelly or glue of a transparent substance, which in these cases perfectly coats over the whole. In this state it gives the naturalist, who is present at the fishing up of his treasures, a transient prospect
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of a very elegant kind, but this vanishes while he admires it. A piece of coral, or other hard substance, thus coated over, appears, as it rises to the surface of the water, of a delicate green, blue, or purple; but when taken above water it is found that this fine colour is only in the coat of glue or jelly which covers the substance; as soon as this is wiped off, the colour is carried away with it, and the coral shews its own native tinge; and it is to no purpose to attempt the preserving of it, by suffering this glue to dry upon the coral, for the colour flies away by degrees, as the moisture evaporates, and the coral, &c. whatever it be, is only so much the less beautiful, than it naturally would have been, as it is covered with a dry yellowish dirty looking horny matter. These are beauties in the sub-marine productions, therefore, which can be only seen by those who venture out in order to take them up.

The small quantities of these elegant colours, which we thus find spread over the surfaces of marine bodies, as we approach deep water, may give a rational idea of what we should find, were we able to examine the bottom of the sea in its deep and unfathomable recesses. It is easy to conceive, that in these places we should find great quantities of the most beautiful substances. Marfigli, Hist. Phys. de la Mer.

Dr. Donati, in an Italian work, containing an essay towards a natural history of the Adriatic sea, printed at Venice in 1750, has recited many curious observations on this subject, and which confirm the above account of Marfigli; having carefully examined the soil and productions of the various countries that surround the Adriatic sea, and compared them with those which he took up from the bottom of the sea, he found that there is very little difference between the former and the latter. At the bottom of the water there are mountains, plains, vallies, and caverns, similar to those upon land. The soil consists of different strata placed one upon another, and for the most part parallel and correspondent to those of the rocks, islands, and neighbouring continents. They contain stones of different sorts, minerals, metals, various putrified bodies, pumice-stone and lavas formed by volcanoes.

The adjacent countries, as well as the bottom of the Adriatic sea, consist of a mass of a whitish marble, of an uniform grain, and of almost an equal hardness; and this marble, in many places under both the earth and sea, is intercepted by several other kinds of marble, and covered by a great variety of bodies, such as gravel, sand, and earths more or less fat. To this variety of soils, he ascribes the varieties observed with respect to the nature and quantity of plants and animals found at the bottom of the sea.

One of the objects which most excited his attention, was a crust, which he discovered under the water, composed of crustaceous and testaceous bodies, and beds of polypes of different kinds, confusedly blended with earth, sand, and gravel; the different marine bodies, which form this crust, are found at the depth of a foot or more, entirely petrified and reduced into marble; these, he supposes, are naturally placed under the sea when it covers them, and not by means of volcanoes and earthquakes, as some have conjectured. On this account, he imagines, that the bottom of the sea is constantly rising higher and higher, with which other obvious causes of increase concur; and from this rising of the bottom of the sea, that of the level of the water naturally results; in proof of which this writer recites a great number of facts. Philosop. Transf. vol. xlix. p. 585, &c.

SEA, Dead. Dr. Perry made several experiments on the water of the Dead sea, in order to find what particles it contained. Upon infusing some scrapings of galls in it, it

becomes of a bright purple colour, but that not till it has stood a considerable time. On adding oil of tartar *per deliquium* to it, it becomes turbid, and looks as if globules of fat were fluctuating in it; this unctuous matter, upon its long standing in repose, comes together in form of a sediment at the bottom. On pouring spirit of vitriol into it, it deposits a milk-white greasy sediment, which, after standing twelve hours, occupies about one-fifth part of the liquor. On putting a small quantity of saccharum saturni to it, it deposits a small quantity of a greyish powder; being severally and separately mixed with a solution of sublimite, with spirit of sal ammoniac, and with sugar of violets, it neither ferments nor deposits any sediment, nor changes colour, except with the sugar of violets, with which it becomes green.

It is highly saturated with salt, so that it is to common water in specific gravity, as five to four; and it has so acrid and styptic a taste, that on being held in the mouth, it constringes it in the manner of alum.

It appears, that this water is impregnated with a sort of an acrid and alkaline nature, and a matter partly of a sulphureous, partly of a bituminous nature. Philos. Transf. N° 462. p. 50. For the observations of other writers on this subject, see ASPHALTITE lake, and DEAD Sea.

SEA, luminousness of the, is a phenomenon that has been taken notice of by many nautical and philosophical writers. Mr. Boyle, after reciting several circumstances attending this appearance, ascribes it to some cosmical law, or custom of the terrestrial globe, or at least of the planetary vortex.

Father Bourzes, in his voyage to the Indies, in 1704, took particular notice of this phenomenon, and very minutely describes it, without assigning the true cause.

The abbé Nollet was long of opinion, that the light of the sea proceeded from electricity, and others have had recourse to the same hypothesis. M. Bayon, in his "Mémoires pour servir à l'Histoire de Cayenne, &c." Paris, 1778, informs us, that, having made a great number of experiments, in different seasons, in order to find out the true cause of this phenomenon, he always found, that the luminous points in the surface of the sea were produced merely by friction.

However, there have been two hypotheses, which have most generally been received, for the solution of this phenomenon; one of which ascribes it to the shining of luminous insects or animalcules, and the other to the light proceeding from the putrefaction of animal substances. The abbé Nollet, who at first considered the luminousness of the sea as an electrical phenomenon, having had an opportunity of ascertaining the circumstances of it, when he was at Venice in 1749, relinquished his former opinion, and concluded that it was occasioned either by the luminous aspect, or by some liquor or effluvia of an insect which he particularly describes; but does not altogether exclude other causes, and especially the spawn or fry of fish.

The same hypothesis had also occurred to M. Vianelli, professor of medicine in Chioggia near Venice; and both he and M. Grizellini, a physician in Venice, have given drawings of insects from which they imagined this light to proceed.

A similar conjecture is proposed by a correspondent of Dr. Franklin, in a letter read at the Royal Society in 1756; the writer of which apprehends, that this appearance may be caused by a great number of little animals, floating on the surface of the sea, which, on being disturbed, might, by expanding their fins, or otherwise moving themselves, expose such a part of their bodies as exhibits a luminous appearance, somewhat in the manner of a glow-worm, or fire-fly; that these animals may be more numerous in some places than others, and, therefore, that the appearance above-mentioned,

tioned, being fainter and stronger in different places, might be owing to this cause; and that certain circumstances of weather, &c. might invite them to the surface, on which, in a calm, they might sport themselves and glow, or in storms, being forced up, make the same appearance.

Mr. Foster, in his account of a voyage round the world with captain Cook, in the years 1772, 1773, 1774, and 1775, describing this phenomenon as a kind of blaze of the sea, and having attentively examined some of the illumined water, expresses his conviction, that the appearance was occasioned by innumerable minute animals of a round shape, moving through the water in all directions. One of these luminous sparks, which stuck to his finger while he was stirring his water with his hand, was examined by the common magnifier of Mr. Ramsden's improved microscope, and was found to be globular, transparent like a gelatinous substance, and somewhat brownish; by means of the greatest magnifier, the orifice of a little tube was discovered, which entered the body of the animal; within which were four or five intestinal bags connected with the tube. He imagines that these animalcules may be the young fry of some species of medusa, or blubber, and considers them as possessed of the power of shining, or of withholding their light at pleasure.

M. Dagelet, a French astronomer, sailing into the bay of Antongil, in the island of Madagascar, observed a prodigious quantity of fry, which covered the sea above a mile in length, and which he at first took for banks of sand, on account of their colour; they exhaled a disagreeable odour, and the sea had appeared with uncommon splendour some days before. On another occasion, having perceived the sea to be remarkably luminous in the road of the Cape of Good Hope, during a perfect calm, he remarked that the oars of the canoes produced a whitish and pearly kind of lustre; when he took in his hand the shining water, he discerned in it, for some minutes, globules of light as large as the heads of pins; upon pressing these, they seemed to be a soft and thin pulp, and some days after the sea was covered, near the coasts, with whole banks of these little fish in innumerable multitudes.

M. Dagelet, in his return from the Terra Australis in 1774, brought with him several kinds of worms, which shine in water when it is set in motion; and Mr. Rigaud affirms, that the luminous surface of the sea, from the port of Brest to the Antilles, contains an immense quantity of small, round, shining polypuses.

M. le Roi, after giving much attention to this phenomenon, concludes that it is not occasioned by any shining insects, especially as, after carefully examining with a microscope some of the luminous points, he found them to have no appearance of any animal; and he also found, that the mixture of a little spirit of wine with water just drawn from the sea, would give the appearance of a great number of little sparks, which would continue visible longer than those in the ocean; the same effect was produced by all the acids, and various other liquors. M. le Roi is far from asserting that there are no luminous insects in the sea; for he allows that the abbé Nollet and M. Vianelli had found them; but he is satisfied that the sea is luminous chiefly on some other account, though he does not so much as offer a conjecture with respect to the true cause.

Other writers, equally dissatisfied with the hypothesis of luminous insects, for explaining the phenomenon, which is the subject of this article, have ascribed it to some substance of the phosphoric kind, arising from putrefaction.

The observations of F. Bourzes, above referred to, render it very probable, that the luminousness of the sea arises from slimy and other putrescent matter with which it abounds,

though he does not mention the tendency to putrefaction, as a circumstance of any consequence to the appearance.

The correspondent of Dr. Franklin, part of whose letter has been already recited, observes, that several gentlemen have been of opinion, that the separated particles of putrid, animal, and other bodies, floating on the surface of the sea, might cause this appearance, for putrid fish, &c. will cause it; and the sea animals which have died, and other bodies putrefied in it since the creation, might afford a sufficient quantity of these particles to cover a considerable portion of the surface of the sea; which particles being differently dispersed, might account for the different degrees of light in this appearance; but he adds, this account seems liable to an obvious objection, *viz.* that as putrid fish, &c. make a luminous appearance without being moved or disturbed, it might be expected that the supposed putrid particles on the surface of the sea should always appear luminous, when there is not a greater light; and, consequently, that the whole surface of the sea covered with those particles should always, in dark nights, appear luminous, without being disturbed, which, he says, is contrary to fact. Franklin's Experiments and Observations, p. 274, &c.

This difficulty is, in a great measure, removed by the experiments of Mr. Canton, recited in the Philosophical Transactions, vol. lix. p. 446, &c. which have the advantage of being easily made, and leave no room for doubt, that the luminousness of the sea is principally owing to putrefaction. Having put a fresh whiting into a gallon of sea-water, neither the whiting, nor the water when agitated, gave any light; Fahrenheit's thermometer, placed in the cellar where the pan was placed, standing at 54°: the following evening, that part of the fish which was even with the surface of the water was luminous, but the water itself was dark; however, on drawing through it the end of a stick, the water appeared luminous behind the stick all the way, but gave light only where it was disturbed: when all the water was stirred, the whole became luminous, and appeared like milk, yielding a considerable degree of light to the sides of the pan, which it continued to do for some time after it was at rest. The water was most luminous when the fish had been in it about twenty-eight hours, but would give no light by being stirred after it had been in it three days. He then put a gallon of fresh water into one pan, and an equal quantity of sea-water into another, and into each pan he put a fresh herring, of about three ounces; the next night the whole surface of the sea-water was luminous without being stirred, but much more so when put in motion, and the upper part of the herring, which was considerably below the surface of the water, was also very bright; while at the same time, the fresh water, and the fish that was in it, were quite dark. There were several very bright luminous spots on different parts of the surface of the sea-water, and the whole, when viewed by the light of a candle, seemed covered with a greasy scum. The third night the light of the sea-water, while at rest, was very little, if at all, less than before; but when stirred, its light was so great as to discover the time by a watch, and the fish in it appeared as a dark substance. After this its light was evidently decreasing, but was not quite gone before the seventh night; the fresh water, and the fish in it, were perfectly dark during the whole time. The thermometer was generally above 60°. Having made artificial sea-water, determined by an hydrometer to be of the same specific gravity with the sea-water, by adding four ounces avoirdupois of salt to seven pints of water, wine measure, he put into a gallon of this water a small herring; and another into a gallon of water, in which two pounds of salt had been dissolved

solved. The next evening, the whole surface of the artificial sea-water was luminous without being stirred, but gave much more light when it was disturbed, and exhibited the same appearances with the real sea-water in the preceding experiment; while the other water, which was almost as salt as it could be made, never gave any light. The herring which was taken out of it the seventh night, and washed from its salt, was found firm and sweet; but the other herring was very soft and putrid, much more so than that which had been kept as long in fresh water. If a herring, in warm-weather, be put into ten gallons of artificial sea-water, instead of one, the water, Mr. Canton says, will still become luminous, but its light will not be so strong.

These experiments confirm an observation of sir John Pringle, that the quantity of salt contained in sea-water hastens putrefaction; but since that precise quantity of salt which promotes putrefaction the most, is less than that which is found in sea-water, it is probable, Mr. Canton observes, that if the sea were less salt, it would be more luminous. See PUTREFACTION.

Mr. Canton observed, as Mr. Ant. Martin Swed. Abhand. vol. xxxiii. p. 225. had done, that several kinds of river-fish could not be made to give light, in the same circumstances in which any sea-fish became luminous. He says, however, that a piece of carp made the water very luminous, though the outside, or scaly part of it, did not shine at all. See this subject farther discussed under the article *Exhibition of LIGHT from Living Animals*.

SEA, *Perils of the*, in *Marine Insurance*, denote, in a large sense, all the accidents or misfortunes to which persons engaged in maritime adventures are exposed; but it has been found convenient to distinguish the losses to which ships and goods at sea are liable, by the "immediate causes" to which they may be ascribed. Accordingly the perils of the sea mean only such accidents or misfortunes as proceed from mere sea-damage, that is, such as arise from stress of weather, winds, and waves, from lightning and tempests, from rocks and sands, &c. A loss by the perils of the sea may therefore happen, 1st, by the ship's foundering at sea, in which case it must generally be total; or, 2dly, by stranding, which is either accidental, in consequence of the ship's being driven on shore by the winds and waves, or voluntary, where she is run ashore either to prevent a worse fate, or for some fraudulent purpose: this stranding may be followed by shipwreck, which occasions a total loss, and if the ship be got off in a condition to prosecute her voyage, the damage sustained and the expences incurred will incur only a partial loss of the nature of a general average; or, 3dly, by the ship's striking against a sunken rock, or something else under water, which may occasion the springing of a leak, or absolute shipwreck. If a ship be not heard of within a reasonable time, she shall be presumed to have foundered at sea. In some countries there is a limitation of time for this presumption; thus in Spain, if a ship has not been heard of for six years from her departure on a voyage to or from the Indies, she is deemed lost; but in France, after a year from the ship's sailing, in common voyages, and two years in distant voyages, the insured may abandon and demand payment, without other proof of loss. In England there is no such limitation of time. When an interval, thought to be reasonable by those who are conversant in maritime affairs, has elapsed, a liberal underwriter will pay his loss; and if there be any ground for doubt, he may either demand security from the insured to refund the money, in case the ship should afterwards arrive safe, or he may trust to his remedy by action, for recovering

Vol. XXXII.

it back. If a ship be driven by stress of weather on an enemy's coast, and be there captured, this is a loss by capture and not by perils of the sea, for which the insured may recover upon a policy against capture only; and yet it has been holden, that capture is a loss by the perils of the sea, as much as if it were occasioned by shipwreck or tempest. If slaves be thrown overboard, on account of a scarcity of water, occasioned by the captain's mistaking his course; this is not a loss by the perils of the sea. The case is the same, if the slaves die for want of food, occasioned by the extraordinary length of the voyage. And if a ship be destroyed by worms, the loss is not attributable to perils of the sea. As to the case of throwing slaves overboard in order to lighten a ship and preserve it in a storm, the practice has been justly reprobated by serjeant Marshall. Every thing on board, however precious, as he humanely and rationally observes, should be thrown into the sea sooner than the meanest slave. Puffendorff also maintains, that whoever, under pretence of saving the ship, shall throw men into the sea, whether they be freemen or slaves, and whether it be done by or without lot, is guilty of homicide; for no man, in order to save his own life, has a right to take away the life of any other human being, who does not attack him.

If, by some extraordinary accident, as the violence of the winds or waves, it becomes necessary to slip a cable, or a cable be broke, and an anchor lost, or a sail or yard be carried away, this is a loss by the perils of the sea within the policy. Also, if animals be insured, their death, occasioned by tempests, by the shot of an enemy, by jettison in a storm, or by any other extraordinary accident, is a loss within the policy; but it is otherwise if their death be owing to disease. The injury occasioned by one ship's running foul of another at sea, is a loss within the policy, unless it be imputable to the misconduct of the master or mariners of the ship insured. In such case, however, this misconduct would, as serjeant Marshall conceives, amount to barratry, and the insurer would be liable for the loss; but an action would lie against the master of either ship, to whom the misconduct is imputable, for the loss which he has occasioned. A loss occasioned by an accidental fire, not imputable to the fault of the master or mariners, is a loss within the policy; and in many places the insurer is held to be liable, even when the fire happens by the fault of the master or mariners; but in France the insurer is not held answerable in such case, unless, by the policy, he be liable for barratry. For every loss occasioned by capture, whether lawful or unlawful, and whether by friends or enemies, the insurer is liable. Marshall on Insurance, vol. ii. See RECAPTURE, RISK, and SALVAGE.

SEA-Adder, in *Ichthyology*, an English name for a sea-fish of the acus kind, called by Willughby the *acus lumbriciformis*. See ACUS and SYNGNATHUS.

It is a small fish of a cylindric shape, without scales, and of a greenish-brown colour, with some admixture of a reddish-yellow.

Their snout is long and hollow, and the mouth opens upwards at its end; the eyes are small, and their iris red; the gills are four on each side, but are covered by a membrane, and the whole body divided into rings like the common earth-worm: it is usually about three or four inches long, and of the thickness of a goose-quill; it has but one fin, which is situated on the back. The anus is much nearer the head than the tail, and under the snout there is always a fleshy tubercle.

The fish is common on the coast of Cornwall. Willughby. SEA-Army. See Naval ARMY.

SEA-*Astrolabe*. See ASTROLABE.

SEA-Banks. (See BANK.) Maliciously destroying sea-banks, by which lands may be overflowed, is made felony without benefit of clergy by 6 Geo. II. c. 25, and 10 Geo. II. c. 32.

SEA-Bat, in *Ichthyology*. See CHÆTODON *Vespertilio*.

SEA-Bear, in *Zoology*, the *Phoca ursina* of Linnæus, called also by some writers the *sea-cat*, and by Pennant the *ursine seal*, inhabits together with the sea-lion and manati, from June to September, the isles that are scattered in the seas between Kamtschatka and America, in order to copulate, and bring forth their young in full security. In September they quit their station in a very emaciated state; some returning to the Asiatic, and others to the American shores, but, like the sea-otters, they are confined to those seas between latitude 50° and 56°. These animals are also common about New Zealand, Staten-island, New Georgia, and the Falkland Islands.

The ursine seals lead, during the three months of summer, a very indolent life; they are confined for several weeks to the same spot, sleep the greatest part of their time, eat nothing, and are totally inactive, the employment of the females in suckling their young excepted. They live in families, each male having from eight to fifty females, which he guards with jealousy; and though they lie by thousands on the shore, each family, consisting sometimes of one hundred and twenty, keeps itself separate from the rest.

The old animals, which are deserted by the females, live apart, and are exceedingly sullen and quarrelsome, very fierce, and so attached to their old haunts, that they would die sooner than quit them; in defending these, discord is sometimes spread through the whole shore. The other males are also very irascible, and the causes of their disputes are generally such as these; an attempt to seduce any of their females, the intrusion of one upon the station of another, and interference in their mutual quarrels. Their battles are severe and bloody, and when they terminate, the combatants throw themselves into the sea, to wash away the blood.

The males are very fond of their young, of which the female generally brings but one at a time, and never more than two: but they are very tyrannical towards the females, which, on the other hand, are very fawning and submissive.

The sea-bears swim very swiftly, at the rate of seven miles an hour; when wounded will seize on the boat, bear it away with impetuosity, and sometimes sink it. They can continue a long time under water. When they want to climb the rocks, they fasten with the fore-paws, and draw themselves up. They are very tenacious of life, and will live for a fortnight after receiving such wounds as would immediately destroy any other animal.

The males of this species are much larger than the females; their bodies are of a conical form, thick before, and tapering to the tail; the length of a large one is eight feet, the greatest circumference five feet, and near the tail twenty inches; the weight 800 lbs.; the nose projects like that of a pug dog, but the head rises suddenly; the nostrils are oval, divided by a septum; the lips thick, and in the inside red and ferrated; the whiskers long and white; the teeth, which are thirty-six in number, lock into each other when the mouth is closed; the tongue bifid; the eyes are large and prominent, and capable of being covered at pleasure with a fleshy membrane; the ears are small and sharp-pointed; the length of the fore-legs is twenty-four inches; the feet are formed with toes, but covered with a naked skin, so as entirely to appear a shapeless mass; the hind-legs are twenty-

two inches long, and fixed to the body behind, but capable of being brought forward, and the feet are divided into five toes; the tail is only two inches long; the hair is long and rough, under which is a soft down of a bay colour; the general colour of these animals is black, but the hairs of the old ones are tipped with grey. The females are cinereous. The skins of the young, cut out of the bellies of their dams, are useful for clothing.

The fat and flesh of the old males are very nauseous, but the flesh of the females resembles lamb, and the young ones roasted are as good as sucking-pigs. Pennant's Hist. Quad. vol. ii. p. 526, &c. See PHOCA *Ursina*.

SEA-Basket. See BASKET.

SEA-Boat, in *Naval Language*, a vessel that bears the sea firmly, without labouring heavily, or straining her masts or rigging.

SEA-Breaches, a term used by the farmers to express the overflowing of their low lands near the sea by the sea-water.

Sea-salt, moderately used, is a great improvement to all lands, but too much of it kills all sorts of vegetables, except such as nature has intended to live among it. See SALT.

The sea breaking in upon lands thus, injures them greatly. The owner is to stop the breach by which it entered with all possible diligence, and then trenches and drains must be cut through all parts of the land to carry the salt-water into some one low place, from which it may be emptied by means of an engine; or if it be small in quantity, it may be laded out by hand over the bank; or if yet less, the sun and winds may dry it away; but in either case, the place where it was suffered to rest must be covered with a large quantity of fresh earth, to take off from the too great saltness of the other; and the whole land should be ploughed for three or four years, to let in the rains and air to freshen it.

SEA-Bream, in *Ichthyology*, the English name for the fish called by the generality of authors the *pagrus* and *phagrus*. According to the new system of Artedi, it is a species of the *spari*, and is distinguished by the name of the *red sparus*, with the skin carried into a finus at the roots of the back fins, and the pinna ani. See SPARUS.

SEA-Buckthorn, in *Botany*. See HIPPOPHAE.

SEA-Brief, in *Marine Insurance*. See SEA-Letter.

SEA-Cabbage, in *Gardening*, the common name of an useful garden plant. See BRASSICA and CRAMBE. See also SEA-Kale.

SEA-Calf, *Phoca vitulina* in the Linnæan system of *Zoology*, is the common seal, with large black eyes, large whiskers, oblong nostrils, flat head and nose, tongue forked at the end, two canine teeth in each jaw, six cutting teeth in the upper jaw, four in the lower, no external ears, body covered with thick short hair, short tail, and toes furnished with strong sharp claws; its usual length is from five to six feet; the colour various; dusky, brindled, or spotted with white or yellow. This species inhabits most quarters of the globe, but is found in greatest number towards the north and south; they swarm near the Arctic circle, and the lower parts of South America, in both oceans near the southern end of Terra del Fuego, and among the floating ice as low as lat. 60° 21' S.

They are also found in the Caspian sea, in the lake Aral, and lakes Baikal and Oran, which are fresh waters, but these are less, and more fat than those of the salt-water. Seals bring forth two young at a time in autumn, which are for a short time white and woolly, and suckle them till they are six or seven weeks old in rocks or caverns, when they take to sea; as they cannot remain long under water, they

they frequently rise to take breath, and often float on the waves.

In summer they sleep on rocks or sand banks ; if surprised, they plunge into the sea, and when at a distance fling up the sand with their hind feet, and make a piteous moaning, as they scramble along ; and if they are overtaken, vigorously defend themselves with their feet and teeth : they are soon killed by a slight blow on the nose, otherwise they will survive many wounds.

These animals swim with great strength and speed, and in their own element sport without fear about ships and boats, which, says Mr. Pennant, may have given rise to the fable of sea-nymphs and syrens. They are gentle and docile ; they feed on all sorts of fish ; are themselves good food, and eat by voyagers : they are killed for the sake of the oil made from their fat, of which a young seal will yield eight gallons ; their skins are useful in making waistcoats, covers for trunks, and other conveniences ; and they are the wealth of the Greenlanders, supplying them with every necessary of life.

We have a draught of this animal in the Philosophical Transactions, N^o 469, by Dr. Parsons, who observes, that Aldrovandus, Johnston, Rondeletius, and Gefner, have made several mistakes in the figures of this creature, so as to convey no just idea of it.

Upon dissecting one of these animals, the stomach, intestines, bladder, kidneys, ureter, diaphragm, lungs, great blood-vessels, and pudenda, were like those of the cow ; the hairs of the whiskers were very horny and clear ; the spleen was two feet long, four inches broad, and very thin ; the liver consisted of six lobes, each hanging as long and as lank as the spleen, with a very small gall-bladder. The beast was long and flabby in its texture in general, having a large foramen ovale, and very great columnæ carnosæ. In the lower stomach were about four pounds weight of flinty pebbles, all sharp and angular, as if the animal chose them of that form for cutting the food. The uterus was of the horned kind, each of the cornua being thicker than the body or duct leading to them : the ovaria were very large, being granulated on the surface with the ova, under a very thin membrane ; and the opening into the tubes leading to the cornua is a great hole.

The authors who have treated on this animal, are Aristotle, Pliny, Aldrovandus, Rondeletius, Gefner, Wolfgangius, and Johnston.

This animal is viviparous, and suckles its young by the mamillæ, like quadrupeds ; and its flesh is carnosus and muscular. That dissected by Dr. Parsons was seven feet and an half long, though very young, having scarcely any teeth, and having four holes regularly placed about the navel, which in time became papillæ. (See *PHOCA Vitulina*.) See a description of other species of seal, with figures, by Dr. Parsons in Phil. Transf. vol. xlvii. p. 109, &c. and Pennant's Hist. Quad. vol. ii. p. 518, &c.

SEA-Chart. See CHART.

SEA-Clay, in *Agriculture*, a muddy sort of clayey matter found on the shores and borders of the sea, which is of a blackish or blueish appearance, and often of a very stiff tenacious quality, not easily mixing with earthy soils. It mostly lies underneath the sandy ouzy matters that are collected in such situations. See SEA-Sand.

In Lancashire they make use of a fat sort of sea-clay, which is dug out close to the shore on the less stiff sorts of land, when in the state of fallow for wheat, in the proportion of about 200 single horse cart-loads to the acre, and believe it to answer better than the common sea-sand, or even sandy mud. It may probably be of a marly nature.

SEA-Coast. See COAST.

SEA-Compass. See COMPASS.

SEA-Cow, in *Zoology* the English name of the *manati*, a species of fish so different from all the other cetaceous tribe, to which it properly belongs, that Artedi, in his new system of ichthyology, allots it a peculiar generic name, which is *trichecus* : in the Linnæan system it is the *TRICHECUS manatus*, which see. This species has thick lips, very small eyes, two small orifices in the place of ears ; neck short, and thicker than the head ; the greatest thickness of the body is about the shoulders, from which it grows gradually smaller to the tail, which lies horizontally, being broad, and thickest in the middle, and growing thinner to the edges, and quite round. The feet are placed at the shoulders ; beneath the skins are bones for five complete toes, and externally are three or four nails flat and rounded ; near the base of each foot in the female is a teat ; the skin is very thick and hard, having a few hairs scattered over it, whence the name *trichecus*, formed of *τριζ*, hair, and *ἰχθυος*, fish. Those animals of this species, that were measured by Dampier in the West Indies, were ten or twelve feet long ; their tail twenty inches in length, fourteen in breadth, and four or five thick in the middle, and two at the edges ; and the largest of them weighed twelve hundred pounds ; but some have been mentioned, the length of which has been sixteen feet and a half, and even twenty feet.

According to Dampier, those which inhabit fresh waters are much less than the others : they inhabit the rivers of Africa, from that of Senegal to the Cape of Good Hope, and abound in certain parts of the eastern coasts and rivers of South America, about the bay of Honduras, some of the greater Antilles, the rivers of Oronoque and of the Amazons.

They sometimes live in the sea, and often near the mouth of some river, into which they come once or twice in twenty-four hours, for the sake of feeding on the marine plants, and they are fonder of brackish or sweet water than of the salt ; and delight in shallow water near low land, and in places secure from furies, and where the tides run gently. They are said to frolic and leap sometimes out of the water to a great height. Their flesh and fat are white, sweet, and salubrious ; and the tail of a young female is much esteemed, and a suckling roasted highly delicious. The thicker part of the skin, cut first into lengths of two or three feet, serves for whips, &c. and becomes tough, when dried, as wood.

These animals are taken by a harpoon stuck in the end of a staff, which the Indians use with great dexterity. If a female with a young one is struck, she takes it under its fins or feet, and shews, in extremity, the greatest affection for its offspring ; and the young one never forsakes its captured parent, but becomes a sure prey to the harpooner.

This animal is called by Herrera *taurus marinus*, or the *sea-bull*, and by others the *tachas* and *la donna*. The French call it *lamantin*, or *namentin*, and the Portuguese *peixe mouller*.

It may seem strange, that so ill-shaped a creature as this should have given rise to the stories of the syrens and mermaids, the sea-men and sea-women, yet there is great reason to believe, that all the fabulous accounts of these monsters, are owing to the sight of this animal, and of the common seal, when raising their head and shoulders above the water. See SEA-man.

Mr. Pennant has described an animal of this species ; which he calls the whale-tailed manati, and which the Russians distinguish by the name of the *морская корова*, or *sea-cow*. This animal, whose feet are merely pectoral fins, and serve only for swimming, brings forth in the water, and, like the whale, suckles its young in that element ; like the

whale, it has no voice, and, like that animal, has an horizontal broad tail, without even the rudiments of hind feet. It inhabits the seas about Bering's, and the other Aleutian islands, between Kamtschatka and America.

In calm weather these animals swim in great droves near the mouths of rivers; when hurt, they swim out to the sea, but soon return again. They live in families near one another, each consisting of a male, female, a half-grown young one, and a very small one; the females oblige the young to swim before them, while the other old ones surround, and, as it were, guard them on all sides. The affection between the male and female is very great, for if she is attacked, he will defend her to the utmost, and if she is killed, will follow her carcass to the very shore, and swim for some days near the place where it was landed.

They copulate in the spring, in the same manner as the human kind, especially in calm weather, towards the evening; the female swims gently about, the male pursues, till tired with wantoning, she flings herself on her back, and admits his embraces; the leonine and ursine seals copulate after the same manner on shore. Steller says, they go with young above a year, and bring forth one at a time, which they suckle by two teats, placed between the breasts. They are very voracious and gluttonous, and feed not only on the fuci that grow in the sea, but such as are slung on the edges of the shore; and when they are filled, they fall asleep on their backs. Their back and sides are generally above water, and as their skin is infested with a species of louse peculiar to themselves, numbers of gulls are continually perching on their backs to pick out the insects.

They continue in the Kamtschatkan and American seas the whole summer, but in winter are very lean. They are taken by harpoons fastened to a strong cord, but after they are struck, it requires the united force of thirty men to draw them on shore. When one is struck, its companions repair to its help, some will endeavour to overturn the boat, by getting under it; others will press down the rope, in order to break it, and others strike at the harpoons with their tails, with a view of getting it out, in which artifice they sometimes succeed. Their noise is like the snorting of a horse, which is occasioned by hard breathing. They are of an enormous size, some being twenty-eight feet long, and eight thousand pounds in weight; the head is small, oblong, and almost square; the nostrils filled with short bristles, the lips double, and the mouth, near the junction of the jaws, full of white tubular bristles, which serve to prevent the food from running out with the water; the lips are also furnished with bristles, which serve instead of teeth to cut the roots of the sea plants; in the mouth there are no teeth, only two flat white bones, one above and another below in each jaw, with undulated surfaces, which answer the purpose of grinders. The eyes are small; instead of ears there are two small orifices; the tongue is pointed and small, the neck is thick, and the head always hangs down. Near the shoulders the circumference of the body is twelve feet, about the belly twenty, near the tail four feet eight inches; the head is thirty-one inches, and the neck nearly seven feet; which dimensions render the animal extremely deformed. Near the shoulders are two feet or fins, two feet two inches long, without fingers or nails; the tail is thick, strong, and horizontal, ending in a stiff black fin, slightly forked. The skin is thick and black; and full of inequalities, and so hard as scarcely to be cut with an ax, without hair; beneath the skin is a thick blubber, which tastes like oil of almonds. The flesh is coarser than beef, and will not soon putrefy. The young ones taste like veal; the skin is used for shoes, and for covering the sides of boats. Pennant's Hist. Quad. vol. ii. p. 536. &c.

The sea-cow of the gulf of St. Lawrence weighs from fifteen hundred to two thousand pounds, and produces from one to two barrels of oil, which is boiled out of a fat substance that lies between the skin and the flesh; it carries its young about nine months, and seldom brings forth more than one at a time. The skin is cut into slices of two or three inches wide, and exported to America for carriage-traces, and to England for glue. The teeth afford an inferior sort of ivory, which very soon turns yellow. Philos. Transf. vol. lxxv. part 2. p. 249, &c.

SEA-Crow, in *Ornithology*, a name given by the common people of many counties of England to the *periw*; which see.

SEA-Crow is also a name given by Edwards to the cut-water of Catesby and Pennant, and to the black skimmer of Latham. See *RYNCHOPS Nigra*.

SEA-Cypress, in the *Verbes Zoophyta*, a name given by Ellis to the *SERTULARIA Cyprifina*; which see.

SEA-Daffodil, in *Botany*. See *PANCRATIUM*.

SEA-Devil, in *Ichthyology*, an English name for the *rana piscatrix*, or *lophius piscatorius* of Linnaeus; a very remarkable species of fish, of a middle nature between the cartilaginous and bony fishes. See *LOPHIUS Piscatorius*.

The branchial holes are three on each side, which are situated deep in the mouth, and open into marsupia or sacculi on the side of the head, the sides of which are the branchiostegeæ, having several long slender cartilaginous bones, running longitudinally for their support, analogous to the branchiostegeal bones of other fishes; and these sacks, Dr. Parsons conjectures, may answer two ends, first, to form the membranæ branchiostegeæ; and, secondly, to make a convenient receptacle for the young till they are able to shift for themselves. If this end, he says, was not to be answered, the branchiæ might have been terminated near their origin in the mouth, as in other fishes. If this fish does not bring forth its young perfect, Dr. Parsons thinks there can be no use assigned for these sacks; but if they are viviparous, then the young may probably be harboured in them, being capable of crawling into them, as we may see by the pectoral webs on the under side; besides, as these fishes crawl on the bottoms of shoal places, watching and alluring their prey, the young must be protected by the parent, till they are able to provide for themselves, which may probably be when they grow too large to enter into these marsupia.

This fish has either no nostrils, or else they are hid within the head, and has a sort of membranous rim running all round the commissures of its sides and belly. Its flesh, when boiled, tastes like that of the frog. Willughby's Hist. Pisc. p. 85, Phil. Transf. vol. xlv. p. 126, &c.

SEA-Dragon, or *Draco marinus*, a species of *Trachinus*; which see.

SEA-Drags, among *Mariners*, are such things as hang over the ship in the sea, as shirts, coats, and even the boat, &c. when towed.

SEA-Eagle, *Aquila marina*, in *Ichthyology*, a species of the raia, with a smooth body and a long serrated spine on a finny tail. See *RAIA Aquila*.

SEA-Eel. See *EEL* and *MURENA*.

SEA-Egg, or *Sea-apple*, the name of the roundish centronia, with crooked or falcated spines. See *CENTRONIA* and *ECHINUS*.

SEA-Fans and *Sea-feathers*. See *GORGONIA* and *SPONGIA*.

SEA-Faring, denotes the condition of a mariner.

SEA-Fight. See *ENGAGEMENT* and *SIGNAL*.

SEA-Fir, a species of *Sertularia*; which see.

SEA-Fox, in *Ichthyology*, an English name for a fish of the *qualus* kind, called also the *sea-ape*; both names being given

given on occasion of the length of its tail in proportion to the body.

The old Greek writers have called it *alopecia*, and the later *vulpes marina*, and *simia marina*, whence the names *sea-fox*, and *sea-ape*. See *Sea-Fox* and *SQUALUS Vulpes*.

SEA-Gage. See ALTITUDE and GAGE.

SEA-Gate, at *Sea*. When two ships are aboard one another, by means of a wave or billow, the seamen say, they lie aboard one another in a *sea-gate*.

SEA-Goose, in *Ornithology*, the *Anas leucoptera*. See DUCK.

SEA-Grape, in *Botany*. See COCCOLOBA.

SEA-Gudgeon, in *Ichthyology*, an English name given to the fish called by the generality of writers *gobius niger*, and the *gobius marinus*.

Artedi, who has made a genus of the *gobii*, excludes the common gudgeon, or *gobio fluviatilis*, from it, but he admits this fish as a genuine species of it.

Athenæus tells us of three kinds of gudgeons, the black, the yellow, and the white. This seems to have been very plainly the black gudgeon of that author. Salvia, in his figure of this fish, has given three fins on the back, but it really has only two. See *Gobius Niger*.

SEA-Hair, a species of *Sertularia*; which see.

SEA-Hare, in the *History of Insects*, the name of the *lernea*; a species of the *Aplysia* and also of the *Tethys*; which see.

SEA-Hen, in *Ornithology*, a name given by some to the *lomwia*, a web-footed bird, common on our coasts, and called the *guillemot*, or *kiddow*. See *COLYMBUS Troile*.

SEA-Holly, in *Botany*. See ERYNGIUM.

SEA-Horse, in *Ichthyology*, the English name of the *hippocampus*, a species of the *acus*, according to the older writers, and one of the *syngnathi* of Artedi. See *SYNGNATHUS*.

The many idle tales reported of this vast amphibious creature, such as his method of bleeding himself when distempered, his vomiting fire when enraged, and the like, have made people, in almost all ages, desirous of seeing the animal. The Romans were fond of exhibiting it in their shows of wild beasts, and the description Pliny gave of it from thence, was all the world knew of the creature for many ages. That author's account, however, of its feeding on grubs on the banks of the Nile, no way agrees with the teeth we find its mouth furnished with.

The skeletons of these animals, as rare as they are with us at present in their recent state, yet are found not unfrequently, in part at least, buried under ground, and that at great depths. The bones of the head are different from those of any other known animal, and when found in some parts of France, had always puzzled the wits of the naturalists there, who had in vain compared them with those of oxen, horses, &c. but at length one of the heads of these animals being sent over to France, cleared up the whole difficulty. The two jaws of this weighed forty-five pounds, and were two feet long, a foot deep, and a foot and half wide.

It is easy to conceive from this, that the accounts we have of the size of the animal are not fabulous, these bones corresponding very well with them. Mem. Acad. Par. 1724.

Sea-horse is also a name sometimes, but improperly, given to the river-horse, or hippopotamus.

Sea-horse is also a name given to that species of seal called walrus.

SEA-Kale, in *Gardening*, the common name of a highly nutritious and palatable culinary vegetable. It is an early esculent plant, the young shoots of which are used somewhat in the manner of asparagus, and may, it is said, be grown, by the method of cultivation which is given hereafter, to a size

and of a delicacy of flavour greatly superior to that which is commonly brought to the table. See CRAMBE.

In addition to what has been offered under that term, it may be noticed that the plant grows naturally the best in a sea sandy soil, or one which is of a loamy gravelly nature near the shores of the sea. In the cultivation of it in the garden, the improved method which has lately been advised, is that of preparing the ground for it by trenching it two feet and a half deep, about the close of the year or in the beginning of it: when not that depth naturally, and of a light quality, it is to be made so by artificial means, such as the applying of a suitable proportion of fine white sand, and very rotten vegetable mould: if the ground be wet in the winter season, it should be completely drained, that no water may stagnate in it near the bottom of the cultivated mould, as the strength of the plants depends upon the dryness and richness of the bottom soil. After which the ground is to be divided into beds, four feet in width, with alleys of eighteen inches between them; then, at the distance of every two feet each way, five or six seeds are to be sown, in a circle of about four inches diameter, to the depth of two inches. This business should be performed in a strictly regular and exact manner, as the plants are afterwards to be covered by means of pots for blanching them, and the health and beauty of the crops equally depend upon their standing at regular distances. If the seeds which were sown were found and perfect, they will come up and shew themselves in the last spring or beginning summer months; which as soon as they have made three or four leaves, all but three of the strongest and best plants should be taken away from each circle; planting out those which are pulled up, which, when done by a careful hand, may be performed so as for them to have the whole of their tap-root in a spare bed for extra forcing, or the repairs of accidents. The turnip fly and wire worm are to be carefully guarded against, the latter by picking them by the hand from out of the ground, and the former by the use of lime laid round the young plants in a circle. When the summer months prove dry the beds should be plentifully watered. As soon as the leaves decay in the autumn they should be cleared away, and the beds be covered with light fresh earth and sand to the thickness of an inch; the compost thus used having laid some time in a heap, and been turned several times, so as to be free from weeds, and the ova of insects as well as grubs. Upon the sandy loam dressing, about six inches in depth of light stable litter is to be applied, which completes the work of the first year.

In the spring of the second, when the plants are beginning to push, the stable litter is to be raked off, a little of the most rotten being dug into the alleys, and another inch depth of loam and sand applied. Cutting this year is to be refrained from, notwithstanding some of the plants may rise strong, and the beds managed exactly as before during this winter season.

In the third season, a little before the plants begin to stir, the covering laid on for the winter is to be raked off, and an inch in depth of pure dry sand or fine gravel now laid on. Then each circle of plants is to be covered with one of the blanching-pots already alluded to, pressing it firmly into the ground, so as to exclude all light and air, as the colour and flavour of the shoots are greatly injured by exposure to either of them. When the beds are twenty-six feet long, and four wide, they will hold twenty-four blanching-pots, with three plants under each, making seventy-two plants in a bed. They are to be examined from time to time, the young stems being cut, when about three inches above the ground, care being taken not to injure any of the remain-

ing buds below, some of which will immediately begin to swell. In this way a succession of gatherings may be continued for the space of six weeks, after which period the plants are to be uncovered, and their leaves suffered to grow, that they may acquire and return nutriment to the root for the next year's buds. When seeds are not wanted, the flowers should be pinched off by the finger and thumb, as long as they appear. Where the expence of blanching-pots is objected to, the beds must be covered with a large portion of loose gravel and mats; but the saving is trifling, when the time and trouble of removing and replacing the gravel, for the cutting of the crop and securing the plant, are considered. By this mode of management, sea-kale is said to have been cut which measured ten, eleven, and even twelve inches in circumference, and that each blanching-pot on the average afforded a dish of it twice in the season.

The blanching-pots for this use are somewhat of the same shape and size as the large bell-glasses commonly employed in market gardens for raising tender vegetable crops, but made of the same materials as the common earthenware, having a handle at the top. They may be about a foot and a half in diameter at the rim where they apply to the ground.

Forcing Sea-Kale.—It is supposed that no vegetable can be so easily and cheaply forced as this, or require so little trouble; as the dung is in the finest state possible for spring hot-beds, after the common crop has been cut and gathered. The principal circumstance necessary in this business, is that of being very attentive and particular in guarding against too great a heat. The temperature under the blanching-pots should constantly be kept as near fifty-five degrees of Fahrenheit's scale as possible, and on no account higher than sixty at any time. In this intention, in either of the two concluding months of the year, as the sea-kale may be wanted more early or late, a suitable quantity of fresh stable dung should be collected and prepared, to cover both the beds and the alleys from two to three feet in height; as in the quantity to be laid on, a great deal must always be left to the judgment of the gardener, as well as to the state of the season as to mildness or severity.

It should invariably be well pressed down between the blanching-pots, heat-sticks being placed at proper intervals, by the occasional examination of which the heat below will be readily shewn. When the dung has remained in this situation four or five days, the pots should be examined to see the state of the shoots. It not unfrequently happens that worms spring above the surface, and spoil the delicacy of flavour in the young shoots. In order to prevent this, it is best to cover it with dry sea-coal ashes, which have been sifted neither very small nor very large. Salt has also the power of destroying them in an effectual manner, without injuring the sea-kale.

The crop, it is said, will be ready to cut and gather in three weeks or a month from the first application of the heat; but as much danger and mischief are the consequence when this is violent, it is advised to begin soon enough, and to force slowly, rather than in too quick a manner. It is likewise necessary to cut the leaves off a fortnight or three weeks before they decay, in those plants which are intended to be forced at a very early period.

It is also suggested that the blanching-pots used in forcing should be made in two pieces, the uppermost of which should fit like a cap upon the lower; as the crop might then be examined at all times without disturbing the hot dung. See *Transactions of the Horticultural Society of London*, vol. i. p. 13.

SEA-Lark, in *Ornithology*. See *CHARADRIUS Hiaticula*, and *EMBERIZA Mustelina*.

SEA-Laurel, in *Botany*. See *PHYLLANTHUS*, and *XYLO-PHYLLA*.

SEA-Laws. See *Laws of OLERON*, *USES and CUSTOMS of the Sea*, and *Marine INSURANCE*.

SEA-Leech. See *HIRUDELLA Marina*.

SEA-Letter, or *Sea-brief*, in *Marine Insurance*, one of the documents expected to be found on board of every neutral ship. This specifies the nature and quantity of the cargo, the place from which it comes, and its destination. This paper, however, is not so necessary as the passport, which is the permission from the neutral state to the captain or master of the ship to proceed on the voyage proposed, and usually contains his name and residence, the name, description, and destination of the ship, with such other matters as the practice of the place requires. This document is indispensibly necessary for the safety of every neutral ship. Hubner says that this is the only paper that is rigorously insisted upon by the Barbary corsairs, by the production of which alone their friends are protected from insult. The passport in most cases supplies the place of the sea-letter.

SEA-Lion, *Phoca leonina* of Linnæus, in *Zoology*, is a species of seal, which inhabits the seas about New Zealand, the island of Juan Fernandez, the Falkland Islands, and that of New Georgia. The animals of this species are seen in great numbers in June and July, the breeding season, on the island of Juan Fernandez, whither they resort in order to suckle their young on shore, and where they continue till September: they bring forth two at a time; and during this season, the female is very fierce. They arrive on the breeding islands very fat and full of blood, and their blubber has been found a foot thick; one of them has been known to yield a butt of oil, and the blood has filled two hogsheds.

Lord Anson's people eat the flesh, calling it beef by way of distinction from that of the common seal, which they called lamb. The old animals, except at the breeding season, are very timid; and to prevent surprise, each herd places a sentinel, who gives certain signals at the appearance of danger; they associate in families, like the sea-bears, and are equally jealous of their mistresses. They are of a lethargic nature, and fond of wallowing upon one another in miry places; they grunt like hogs, and snort like horses.

During the breeding season they abstain from food, and become very lean; at other times they feed on fish and the smaller seals. The male has a projecting snout, hanging five or six inches below the lower jaw; the upper part consists of a loose wrinkled skin, which the animal when angry has the power of blowing up, so as to give the nose an arched appearance; the feet are short and dusky, having five toes on each, furnished with nails; the hind-feet appear like lacinated fins; the eyes and the whiskers are large; the hair on the body is short and of a dun colour; that on the neck a little longer, and the skin very thick. The length of an old male is twenty feet, and the greatest circumference fifteen. The nose of the female is blunt and tuberculous at the top; the nostrils wide; the mouth breaking very little into the jaws; two small cutting teeth below; two small and two large above; two canine teeth, remote from the preceding, five grinders in each jaw, and all the teeth conic; the eyes oblique and small; no auricles; the fore-legs twenty inches long; the toes furnished with oblong flat nails; the hind parts, instead of legs, divided into two great bifurcated fins; no tail; and the whole covered with short rust-coloured hair. The length from the nose to the end of the fins is four yards, and the greatest circumference two and a half. Pennant's *Hist. of Quad.* vol. ii. p. 531. See *PHOCA leonina*.

SEA-

SEA-Loufe, *pediculus marinus*, a name given to the Mollusca crab.

SEA-Lungs, in the *History of Insects*, the English name of a species of medusa.

SEA-Man. We have many accounts, even from authors of credit, of something resembling the human figure seen at sea, and fancy has carried them to such a height, that the truth of the description is lost in most of them.

The syrens, which we have accounts of even in Bartholin, and the sea-man, or *homo marinus*, as it was called, seen and described by Barchewitz, give the greatest credit to the story; but writers are so fond of telling marvellous things, that great allowances are to be made in the reading.

The general description of the sea-man is, that from the navel downwards the whole is only a shapeless lump of flesh, without any the least mark, either of limbs, fins, or tail. On the breast there stand two pectoral fins, which are each composed of five bones or rays, resembling the human hand, and connected together by a membrane like the toes of a duck, or some other water-fowl's foot.

These fins are what have the appearance of something human, and when seen about the bosom of a white-bellied fish, may be taken for hands with short arms, and the resemblance of a head is easily fancied. These fins are not peculiar to any one kind of fish; but the manati or sea-cow, the rana piscatrix or lophius, and many others, have them. It is probable, from most of the accounts we have, that the manati, or sea-cow, is the creature which, being seen raising its head above water at a distance, and extending these pectoral fins, which are what it swims with, has given rise to the idea of the upper parts of a human figure.

As to the description of a shapeless lump of flesh making up the lower part of the animal, it seems too contrary to the course of nature in all other sea-animals, to have any foundation in reality, and probably was only the invention of the describer, to make out what he did not see above water.

It is true, that Barchewitz takes great pains to prove that the sea-man, or *homo marinus*, he describes, was a wholly different creature from the sea-cow; but his description of it carries too little the air of any thing in nature, to meet with an easy credit.

It is wonderful, that so judicious a writer as Artedi should give any faith to the existence of so strange a fish as this, but he mentions it with a great air of distrust, and wishes a more perfect history of it, if it any where exists.

The public are often imposed upon by cheats, who shew different things under the name of sea-men, mermaids, and syrens; but if we may judge of the generality of these creatures, thus shewn, by the latest instance among us, they are very wretched counterfeits indeed. This creature was said to be a young mermaid taken on the Acapulca shore, and maintained its credit so well in London, as to afford the proprietor a comfortable subsistence for ten months among us, though no other than a human fœtus of about eight months, with a hydrocephalus head, and with the two legs growing together, and covered by one common membrane: the toes of this fœtus were beat out into a resemblance of fins.

SEA-Mark, a point and conspicuous place distinguished at sea. See *LAND-Mark*, *BEACON*, and *BUOY*.

SEA-Moss. See *CORALLINE* and *CONFERVA*.

SEA-Mouse, in the *History of Insects*, the English name of the aphrodita.

SEA-Mud, in *Agriculture*, that sort of muddy deposition which is often taking place on the shores and coasts of the sea, and which occasionally forms a constituent part of the

soil of the lands in such neighbourhoods. In some instances it is of a rich improving quality, but in the other cases it partakes of a clayey unproductive nature, especially that which is of a black, tough, crude description. In some places where this material is found of use as a manure, they distinguish it into two kinds, or that which is taken from the surface, and called *green-sod* mud, or sludge, and that which is raised or taken before it is covered with green sward, denominated *Job* mud. The former is by much the richest and strongest as manure, therefore the best calculated for application in this way, where it can be procured.

It is sometimes employed in preference to marle, though that substance may be more ready at hand, in the proportion of about three roods to the statute acre, being laid on the lay ground in autumn, that is to be broken up in the following spring months. It is mostly got by digging it up only one spit depth from the surface. After being spread out, and well broken down and reduced, it is turned down into the soil by the plough. It is useful for oat, barley, potatoe, and wheat crops, producing a large return. It is also very durable as a substance of this nature, lasting longer even than marle, and being never liable to injure grass-lands. This sort of rich sea-mud is mostly met with on the banks or shores near the mouths of large rivers which empty themselves into the sea, but in other cases its fertilizing properties are often less to be depended upon.

The muddy matter which is combined with sandy materials on the sea-coasts in some districts, is also found of great utility as a manure.

SEA-Nettle. See *NETTLE*.

SEA-Oak. See *WRECK*, and *FUCUS*.

SEA-Officer. See *OFFICER*.

SEA-Onion, in *Botany*. See *SCILLA*.

SEA-Otter. See *OTTER*.

SEA-Ouse, in *Agriculture*, a rich sort of mud or deposition raised from the sea-shores in different parts of the kingdom, and which has been found in many cases of much use as a manure. It might probably be found good, and in large quantities, in many situations on the sea-coasts, where it has not yet been thought of by the farmer. As there can, however, be no doubt of its possessing a highly enriching property, it should be diligently provided in all places where it can be had. It is stated, in the Norfolk Agricultural Survey, that Mr. Palgrave, at Coltershal, uses much sea-ousy mud scraped up by the *beaver* from the bottom of Yarmouth Haven. He lays on forty loads *per* acre, and has thus manured seventy acres; the improvement is very great. It was found on trial that it is a calcareous ousy-mud; and that on scalds or burning-places, and sand or gravel, it forms a cold bottom, and is an effectual cure. Fifty loads *per* acre of sea-ouse have been used on the upland loams of Warham with very great success; superior crops the consequence. And another substance may be considered under this head, though in the above Agricultural Survey it has been described under that of sea-weed, which it does not seem so properly to belong to. It is found on the coast at Thornham, being marked in Mr. Faden's map of the country for what is termed *crabs*, *scalps*, and *oak-roots*. It is stated by the writer on examining it, to be obviously the ruins of a forest of large trees, the stumps and roots remaining, but in such a state of decay, that with a spade he dug into the centre of many, and might have done of all, with as much facility as into a mass of butter. Where the stumps are not found on digging, a black mass of vegetable fibres, apparently consisting of decayed branches, leaves, rushes, flags, &c. is turned up: to what depth this vegetable stratum extends, has not been ascertained, but at some creeks

creeks on the very edge of the sea at low water, there is a very fine foamy sea-ouse at two or three feet depth: the extent of this once sylvan region, which every common tide now covers, can scarcely be less, in one place only, than from five to six hundred acres. There is not an appearance of any tree lying at present from the stump, as if blown down or left after falling, but rather that of a forest cut down in haste, the stems cleared and hurried away, leaving the branches to rot; but this is mere conjecture. It is remarkable that there is not, as he is informed, any mention of this ruined forest in the old historians of the county; nor does tradition offer the least conjecture or report on the subject. Trees, roots, and stumps, are very common in bogs, wherever found; but here is not the trace of any thing like a bog, the earth is solid, and all a fine ouse, or sea-clayey mud. It is added that Mr. Rishton viewed these relics with the eye of a farmer; for experiment, he sent his carts down for some, and spread ten loads *per* acre of it, for turnips: it answered perfectly, and on comparison equalled his yard-dung, and also rape-cake. In another experiment, he manured two acres for wheat, with a compost, consisting of nine loads of this weed, (or ouse,) and three chaldrons of lime mixed; one acre with yard-muck; one acre with tallow-chandlers' graves, sixteen bushels, and the rest of the piece with rape-cake; the graves were, in effect, far beyond all the rest; between which the difference was not very perceptible. The expence only 1s. *per* load; but if a barge was floated to the spot, and anchored when the tide was in, for loading at low water, it might be procured at a much cheaper rate. And it is suggested, that this ingenious cultivator has opened a real mine to such farmers as shall have the sagacity to dig in it: it appears astonishing, he thinks, that none of them should long ago have made the same experiment, and consequently have profited by so beneficial a vicinity.

Without doubt, by proper examination, other situations might be found to afford substances that might prove useful as manures.

SEA-*Owl*, in *Ichthyology*, a name given by many to that fish which we more usually call the *lump-fish*, the *lumpus* of Willughby, &c. and the *cyclopterus* of Artedi. See *CYCLOPTERUS lumpus*.

SEA-*Pea*, in *Botany*. See *PISUM*.

SEA-*Pearch*, in *Ichthyology*. See *PERCA*.

SEA-*Pen*. See *Sea-PEN*.

SEA-*Pheasant*, in *Ornithology*, the name of a bird of the duck kind, but differing from all the other species in the shape of its tail, which has two long feathers standing out beyond the rest, and terminating in a point. It is called more generally the *cracker*. See *DUCK*.

SEA-*Pie*. See *PICA marina*, and *HÆMATOPUS ostralegus*.

SEA-*Pigeon-Pea*, in *Botany*. See *SOPHORA*.

SEA-*Pike*, in *Ichthyology*. See *ESOX belone*.

SEA-*Pink*, in *Botany*. See *CERASTIUM*.

SEA-*Plants*, a denomination comprehending those marine productions which are formed by insects, and which properly belong to the animal kingdom: however, they so much resemble vegetables in their form, that they have been long taken for plants called by this name, and classed under the vegetable kingdom.

Count Marigli, who was at indefatigable pains to collect the various sea-plants of several places, divides all these productions, which he referred to the rank of vegetables, into three classes. The first class contains the soft or herbaceous ones; such are the *algæ*, called *sea-wrecks*, the *fucuses* or *sea-oaks*, the *sea-mosses* or *conferwæ*, and the different species

of *spunges*: the second class comprehends those that are ligneous, or of a woody hardness, which were called *lithophyta* by the ancients, as if their hardness approached to that of stones; these, Marigli says, consist of two substances, a cortical and an internal; the cortical part, while in the sea, is soft, but in drying becomes as hard as chalk, and easily crumbles between the fingers; the internal substance seems more of the nature of horn than of wood; when burnt it throws out a spume, or froth, like that which horns or feathers of animals yield in the fire, and their smell in burning is of the same kind; the branches of these are very pliable, bending in the manner of whalebone, and giving the same resistance to a knife in cutting. The third class comprehends those plants which are of the hardness of stone, and which should properly be called the *lithophyta*: these are the several species of *coral*, *madrepora*, and the like.

Marigli endeavours to explain the differences of these several substances, and to account for the manner of their receiving nourishment, agreeably to the system which prevailed in his time, and which appropriated them to the class of vegetables. Marigli, *Hist. Phys. de la Mer. Mem. de l'Acad. Par. 1710*.

By later experiments and observations, it has been sufficiently demonstrated by M. Peyssonnel, Bernard de Jussieu, Donati, &c. that those marine substances which Marigli thought to be plants, are the work and habitation of animals. See on this subject the articles *CORAL*, and *CORALLINES*.

Dr. Lister apprehends, that those substances, which in his time were thought to be sea-plants, serve to render a great deal of the sea-water fresh, and give it in mists to the clouds, whence it again falls on the earth: this is easily proved by experiment, thus; if a quantity of sea-water be put into a long glass body, and into it there be put a large and vigorous sea-plant, such as the common seawreck, and the head placed on the glass, and a receiver fitted for it without cutting the joints, there will daily distil into the receiver, without giving any fire below, a clear and sweet water, fresh and potable, and without any disagreeable or unwholesome quality. The quantity is but small that is obtained in this way, but it is evident, that in the same manner a very immense quantity of the sea-water is every hour made fresh, and raised up into the air from the infinite number of plants that grow in it. Dr. Lister even thinks that the tropic winds, which blow constantly one way, may be owing to this sort of cause. *Philos. Trans. N° 156*. See *TROPIC winds*.

SEA-*Purflane*, in *Botany*. See *ATRIPLEX*.

SEA-*Quadrant*. See *BACK-staff*, and *QUADRANT*.

SEA-*Room*, denotes a sufficient distance from the coast, as well as from any rock and shallows, by which a ship may drive or scud without danger of shipwreck.

SEA-*Salt*. See *SALT*.

SEA-*Sand*. See *SAND*, and *Common SALT*.

SEA-*Sand*, in *Agriculture*, that sort of sand which is thrown up in the creeks and other places on the coasts of the sea, and which is often very useful as manure. The sea-sand, which is thrown up in creeks and other places, is very rich and proper for this purpose. In the western parts of England, which lie upon the sea-coasts, very great advantage is made of it. The fragments of sea-shells, which are always in great abundance in this sand, add to its virtues; it being always the more esteemed by farmers, the more of these fragments there are among it. The sand of this sort, which is used as a manure in different parts of the kingdom, is of three kinds: that about Plymouth, and some other of the southern coasts, is of a blue-grey colour, like ashes, which is probably owing to the shells of muscles, and other fish

fish of that or the like colour, being broken and mixed with it in great quantity. Westward, near the Land's-End, the sea-sand is very white; and about the isles of Scilly it is very glistening, with small particles of talc. On the coasts of the North sea the sand is yellowish, brown, or reddish, and contains so great a quantity of fragments of cockle-shells, that it seems to be chiefly composed of them. That sort of sea-sand is accounted best, which is of a reddish colour: the next in value to this is the blueish, and the white is the worst. This kind of sand is the best when taken up from under the water, or from sand-banks, which are covered by every tide. And it is remarked, that the small-grained sand is the most sudden in its operation, and it is therefore best for the tenant who is only to take three or four crops; but that the coarse, or large-grained sand, is much better for the landlord, as the good it does lasts many years. Where sand is dredged out of the sea, it is usually much dearer than where it is taken from sand-banks.

In the northern parts of Lancashire, and in Cornwall, the more light sorts of land in the vicinity of the sea-shores, are in many cases much improved by the application of sea-sand upon them. The practice is to lay it on in a pretty thick manner, in order that it may be well incorporated with the soil, by the different ploughings before the wheat is sown. In this way large crops are often afforded, and the effects of the dressing last several years. It is likewise found very beneficial when applied thinly over the surface of grass-lands in rendering the herbage more fine and sweet. It is a substance that might in many situations be much more extensively made use of than has hitherto been the case. See *SAND, Shelly*.

This sort of sand is considered as a vast treasure by the farmers in some parts of the county of Cornwall, as has been already hinted at, especially where the sea-coast is extensive. It is supposed to be a substance that feeds the corn, as well as pulse-crops and roots, well, and which is highly useful on pasture-land; it being material to the value of farms whether they are near to or remote from it. It is, however, procured from great distances in some cases. Its goodness greatly depends, however, upon the quantity of calcareous and animal matter which it contains, in addition to the mechanical effects which it affords; with some kinds of it, slimy, earthy, ligneous vegetable, and animal matter, are combined, in which case it is denominated *lig* or *lignan*, and thought of great value for potatoe crops. The large-sized coral sand is supposed the most lasting in its effects; but the smaller grained and shelly sorts are extensively used in some places.

When this sort of sand is applied alone, either on tillage or grass-land, it is called *clean sanding*; but it is more usually laid on in mixture with earth and dung in the way of a compost. It is employed in all the proportions of from three hundred to thirty sacks of sixteen gallons each, to the customary acre of that district. Its utility depends much on the nature of the lands, being more beneficial on the moory and the thinner sorts of soil, than on the deep loamy kinds.

It is computed that more than 54,000 cart-loads of it are taken from the harbour of Padstow alone, and that the expence of land-carriage for this article only, for the whole district, is more than 30,000*l.* a-year.

In some of the northern parts of the county of Lancaster, sea-sand was formerly much had recourse to on tillage and other land, as has been seen above, but it has lately been less employed. They apply it from 80 to 300 or 400 single horse cart-loads to the customary acre, every ten or twelve years, mostly for the wheat crop. The dry sea-sand was

formerly made use of, but very seldom at present, as the muddy, or that dug from some depth, and intermixed with mud, is now found much better. It is of a blackish appearance, and said to last longer in the soil, and produce better crops than the common sand. In one trial, the muddy sort had vastly the advantage, both in the immediate and future crops. It is sometimes, likewise, laid upon the grass, it is said, with good and lasting effects. In three small trials made with it by the Rev. Mr. Stainbank, it seemed however to be of little utility. He applied it on two ridges, on common pasture, on meadow and on ploughed land, in the quantity of 200 single horse cart-loads to the customary acre of each, and found not the least alteration or improvement in the crops of any of them. It is, however, remarked, in the Agricultural Survey of the North Riding of York, that in many cases in the vicinity of the sea, use has been made of sea-sand as a manure with constant success, and that for the districts of Cleveland, and the coast where the wet adhesive clays want draining and breaking, and in most parts of which it might be easily procured, it would be equally useful. It is supposed to be there disregarded in consequence of its great plenty, and being capable of being provided without expence. See *SAND*.

SEA-Scorpion. See *SCORPIO*.

SEA-Serpent. See *Sea-SNAKE*.

SEA-Shells, in Agriculture, such as are formed and dug from the creeks and bays on the sea-coast. They are constantly very beneficial in improving land in all situations where they are met with in sufficient quantity. But the great use of marine shells is more shewn in the following passage in the statistical account of the parish of Kirkcumbreck, in Galloway. The principal manure used there for improving land is sea-shells, of which there is an almost inexhaustible quantity, not only within the high-water mark on this side of Wigton bay, but also in the dry land, several hundred yards from the shore. These shells are sold at five-pence *per* ton, twenty-five of which are sufficient for an acre; and prove a cheap and excellent manure, preferable to either lime or marle. Many thousand tons of these shells are annually carried (by vessels constantly employed in the business) all round the coast, and sometimes even to the Isle of Man. These shells have been used with great advantage for the improvement of barren heathy land, inasmuch, that many hundreds of acres in this parish, originally not worth more than 2*s.* *per* acre, have been made worth from 10*s.* to 15*s.* *per* acre. Yet this, like every other advantage that is easily attained, is not duly prized; for upwards of one thousand acres in this parish, though capable of cultivation, lie in a state of nature, covered with heath, and almost good for nothing. A little calculation might serve to shew landlords, that on nothing could they lay out their money to so much advantage. As for a tenant, where he has only a lease for nineteen years, and perhaps his encouragement not great otherwise, it cannot be expected he should do much in the cultivation of barren land. The tenant, however, might well lay these sea-shells on land already cultivated. This hint should be duly attended to by the cultivators of such lands, in situations where such manures can be readily provided. It is observed, that in Loch Tarbet there is an immense number of oyster-shells, almost unmixed with any sand, when the thin stratum above them is removed: the extent of this astonishing mass of shells is unknown, but it is probable it can never be exhausted. A vast tract of improveable moorish land in the neighbourhood, may, some time or other, shew that Providence did not place this fund of manure in vain so near it. For such moorish heathy ground, these sea-shells are the fittest manure,

nure, but their use ought not to be confined to it. In order to make the carriage lighter, and the effect the quicker, perhaps it would be worth while to burn them first, as is sometimes done to marle. The kiln might be made with one or two eyes, running into it about half way at the bottom, with some flags or stones rudely arched over them, the kiln then filled with shells, and fed with fire for a day or two, as might be found necessary. Lime is burned in this way in the space of two or three days, and shells already in a mouldering state, would take much less both of time and fuel. The operation would not be hindered by the tides, as these shells are found also under the surface beyond the sea-mark. Stratus of these oyster-shells are also to be found at the head of Loch Caules port; but there (so slow is the progress of the improvement!) they have not yet begun to use them as manure: probably the time is not distant when these sea-shells will become an article of commerce, and be carried at least along all the shores of Kintyre.

And it is stated by the author of the Agricultural Report of Norfolk, that in East Winch and West Bilney, and scattered for ten miles to Wallington, there is a remarkable bed of oyster-shells in sea-mud; the farmers use them at the rate of ten loads an acre for turnips, which are a very good dressing; they are of particular efficacy on land worn out by corn. Mr. Forster several years ago laid twenty loads an acre on some worn-out land, and they had an amazing effect in producing grafs, when laid down in seeds, giving a deep luxuriant hue like good dung: the benefit very great at the present time. They are found within two feet of the surface, and as deep as they have dug, water having stopped them at sixteen or eighteen feet deep. They are used again and again on the same land, and with the same effect. At East Winch, Mr. Crowe has acres together of this most valuable manure. They fall to powder on being stirred. All sea materials of this nature should constantly be well attended to, and collected when wanted to be employed as manure by the farmer. Where they are in a solid state, they only require to be in some measure broken down into a sort of coarse powder. See SAND and SHELLS.

It may be noticed, that in the first mentioned district, the price of the shells is now higher than it was formerly.

SEA-Sickness is said to be prevented by drinking sea-water mixed with wine.

SEA-Side-Grape, in Botany. See COCCOLOBA.

SEA-Spleenwort, or Polypody, a name given by Ellis to the *Sertularia lichenastrum*.

SEA-Sun-Crown, American. See AMERICAN, &c.

SEA-Swallow, in Ornithology, the name of the *Sterna hirundo*, common on our coasts. See STERNA.

SEA-Tamarisk, a name given by Ellis to the *Sertularia tamariska*.

SEA-Tangle, in Agriculture. This is another name by which the sea-weed which is usually made use of as a manure is known in some districts, especially those of the north, where it is sometimes collected, and applied, either in its simple state, or when made up into compost with some sort of earthy substance. See SEA-Weed.

SEA-Turtle Dove. See Sea-Turtle DOVE.

SEA-Wall, in Rural Economy, that sort of wall or defence which is thrown up and provided against the sea on the different coasts of the kingdom. It is formed of various kinds of materials, according to the nature of the situation and circumstances, such as those of earth, stones, shells, strong gravel, and many other matters, so as to constitute a sort of embankment. See EMBANKMENT and EMBANKING.

Walls or banks of this nature should constantly have a good degree of slope backwards, whatever the nature of the

materials may be which are employed in their construction, as this form always affords great safety and protection to them. The bases or foundations of them should likewise be securely laid, and well guarded and protected by every possible convenient means which their situations and circumstances will admit of; and the internal parts have a sufficient weight of earthy or other matter thrown up and laid against them, in order to counteract the weight of the water during the time of the tides. In Essex, Mr. B. Dudley is said to have endeavoured to give a new direction to a shifting bank of shells, as a guard to a sea-wall, which had been newly repaired and was much exposed, and by that means to convert it into this sort of defence and security, which he accomplished in the following manner; a faggot-hedge was made in the ouze, in order to retain the shell-sand, which being found to have taken effect, a second was formed. The shelly bank, it is said, shifted, though slowly, according to his intention, and that he had the rational expectation of fully availing himself of it to strengthen his wall, at little more expence than that of thinking. It is suggested, that opportunities of this nature frequently present themselves, but are wholly neglected and turned to no account.

It might not be an object unworthy of attention, it is supposed, to have a general commission of sewers, &c. for the repairs and preservation of sea-walls along the coast, which protect lands the most capable of improvement from the destructive inundations of the sea-water, which leave such fatal well-known effects behind, that the ground is not worth the tillage for some years after being overflowed, and, besides, the expence and trouble that may have been laid out upon it are mostly for ever lost. As the matter now stands, it is common for the owners of the land to manage their own walls according to their own discretion, by which means the neglect or inattention of an individual may cause, not only ruin to himself, but many of his more careful neighbours, and spread a general distress around him. This is the state of the case in the above county, and in others it is probably much the same, where they border on the sea.

SEA-Ware, in Agriculture, a term frequently applied to the weed thrown up by the sea in many situations, and which is collected and made use of as a manure, and for other purposes. It is the quercus marina, and has often the names of sea-wreck, sea-tangle, &c. See SEA-Weed.

SEA-Water, that briny bitterish fluid which constitutes the sea. See WATER.

SEA-Water, in Agriculture, that which is brought by the sea, and much impregnated by saline matters. It is suggested in the Argyleshire Agricultural Survey, that as it is known that salt is beneficial as a manure, sea-water, which is found to contain it in the proportion of about a bushel to a ton, may also be recommended in the same view. And that, from its promoting putrefaction, it may be applied to peat-earth, dung-heaps, and composts, with much advantage in many situations. This sort of water, where it stagnates for any length of time on land, is, however, found to be very injurious. See SALT-Water.

SEA-Weeds, in Botany, the Submersed Algae of some scientific writers, are such cryptogamic plants as grow under water, in the sea, fixed by their base, originally, to some rock, stone, or shell, but often found floating without any attachment. Their feeds are, in many instances, known, but the economy of their fructification has not yet been satisfactorily explained, notwithstanding the labours of Reaumur, Gmelin, Gærtner, Correa de Serra, Vellay, Turner, and others. See CONFERVA, FUCUS, ULVA, &c.

SEA-Weed, in Agriculture, the wreck or weed thrown up by the water on the sea-coasts, and sometimes cut from their sides.

sides. It is the plant known by the name of *quercus marina*. And it is a material much used as a manure in some districts, as those of Kent, and the northern counties, as well as in the islands of Jersey and Guernsey. It is found to become tender and easily reduced by remaining some time in heaps, and taking on the process of fermentation. It is strongly impregnated with saline matters, and of course proves a beneficial application for land.

It is said to have been found, in the practice of Mr. Rudd in Yorkshire, to answer well in composition with kelp, ashes, slum from the alum-works, and lime, the whole being mixed up with earth. But in many places it is made use of in its simple state, after having undergone a degree of fermentation, or after being incorporated with yard-dung. In the Agricultural Survey of Argyleshire it is stated, that along all the coasts it is much used as a manure, though not always valued as much as it ought. Its effects are not so lasting as that of dung, nor is it so great when laid on in winter as in April or May, when it is riper, and more impregnated with salts. What comes ashore during summer after the ground is sown, the more careful farmers gather into heaps, or spread on lay-grounds. In either way it turns to little account. Much of the heaps melt away, and much of what is spread dries and shrivels to nothing. If mixed with earth, moss, fern, weeds, &c. in a compost, it would produce a quick and strong fermentation, and all its juices would be preserved. This is the way to make the most of this great gift of Providence, and the farmer and cottager both should thus increase their store of manure wherever it can be done.

It is likewise noticed, that in the above islands, where this weed has been long employed, it is cut twice in the year, the first cutting in February or March being applied as a manure on the pasture grounds, nursery lands, and those sown with barley. It is used in the proportion of two cart-loads, weighing two thousand pounds each, with six carts of stable dung to a 1000 feet square. The second cutting, which is performed in July, is laid to dry on the sea-shore, and afterwards made use of as fuel; the ashes of which are found an admirable manure, especially on stiff land. It is spread over the surface of the land in the winter season, or early in the spring, in the proportion of about half a bushel to the perch. It is said to have a great effect in giving a full ear to the grain, and to prevent its being laid.

But it has not yet been ascertained upon what sorts of land the weed in its simple state has the most effect. It is found to afford great vigour of growth to plants in all kinds. It has generally been supposed to have little effect beyond the immediate crop; but when duly blended and incorporated with other proper earthy or other materials, it has been found to be more lasting in its effects, and to be more proper in this application. See MANURE.

The plants of this sort, however, which are made use of as manure on the sea-coasts of this country and Ireland, consist of many distinct species of *fuci*, *algæ*, and *conserveæ*, according as they prevail in different parts. Sir Humphrey Davy found by different processes, in the common fucus, which is commonly the most abundant of any on our sea-coasts, in one mode one-eighth of gelatinous substance similar to mucilage, and in treating it another way, nearly four-fifths of its weight of water, but no ammonia; the ashes contained sea-salt, carbonate of soda, and carbonaceous matter. The gaseous matter was small, and chiefly carbonic acid, gaseous oxyd of carbon, and a little hydro-carbonate.

This manure is said to be transient in its effects on land, not lasting more than a single crop, which may be readily accounted for from the large proportion of water, or the ele-

ments of water, which it contains. It decays, on exposure to the atmosphere, without any heat being produced, seeming to melt down as it were, and dissolve away. A large heap has been known to be wholly reduced to a little black fibrous matter in less than two years. The firmest part of a fucus being let remain in a jar with atmospheric air for a fortnight, became much shrivelled, and the sides of the jar covered with dew, the air being found to have lost oxygen, and to contain carbonic acid gas.

The suffering this sort of weed to ferment before it is used, is thought wholly unnecessary, as there is no fibrous matter rendered soluble in the process, and a portion of the manure is lost. The practice of the best farmers in the western parts of this country, is said to be that of using it as fresh as it can be had, and that the results of this method are exactly in conformity to the theory of its operation. "The carbonic acid formed by its incipient fermentation must be partly dissolved by the water set free in the same process; and thus become capable of absorption by the roots of plants." That the effects of this weed as a manure must chiefly depend upon this carbonic acid, and the soluble mucilage it contains; and it has been found that "some fucus which had fermented so as to have lost about half its weight, afforded less than one-twelfth of mucilaginous matter, from which it may be fairly concluded that some of this substance is destroyed in fermentation."

There is unquestionably a great loss sustained in this and perhaps other ways, where earthy matters are not used with it.

SEA-Willow, a name given by Ellis to the *Gorgonia anceps*.

SEA-Worms. See WORMS.

SEA-Worthy, in *Marine Insurance*, a term applied to a ship, denoting that she is "tight, staunch, and strong, properly manned, and provided with all stores," so as to be in all respects fit for the intended voyage. In every insurance, either on ship or goods, there is an implied warranty that such is the state of the ship, so that the insurer may gain the premium for indemnifying the insured against certain contingencies; for if the ship is incapable of performing the voyage, there is no possibility that the insurer should gain the premium; and in that case, the contract, on his part, would be without consideration, and consequently void. The insurer undertakes to indemnify the insured against "the extraordinary and unforeseen perils" of the sea; and it would be absurd to suppose that any man would insure against those perils, but in the confidence that the ship is in a condition to encounter the "ordinary perils," to which every ship must be exposed in the usual course of the voyage proposed. In France every ship is surveyed, before the commencement of her voyage, by officers appointed for that purpose, who make their report; but the report upon such survey was not sufficient proof of sea-worthiness, and it still rested with the insurers to shew the contrary. A ship should be presumed not to have been sea-worthy, unless it be made to appear that her disability arose from sea-damage, or other misfortune. It is a wholesome rule, all circumstances considered, says serjeant Marshall, that the insured shall be held to pretty strict and cogent proof of the ship's being sea-worthy, fit for performing the voyage insured, with the proposed cargo on board, and in all respects fit for the trade in which she is intended to be employed. It is also a wholesome rule, that this proof shall not only be cogent and strong to shew the ship's sufficiency at the time when she failed, but also that the insured shall bring forward all the evidence which he has upon this subject; particularly what relates to the state she was in when the loss happened,

or when she was condemned as unfit to proceed on the voyage. If any thing should be withheld, which the insured might have produced, it will always throw great suspicion on his case. If, on the other hand, it appears from the facts of the case, that the loss may be fairly attributed to sea-damage, or any other unforeseen misfortune, but yet the insurers mean to allege that the ship at her departure was not sea-worthy, the *onus probandi* will lie on them. This seems to be the simplest rule; and the simplest rules are always the best, particularly in matters of commerce. If it be clearly ascertained that the ship, at the time of her departure, was not in a condition to perform the voyage insured, neither the innocence nor ignorance of the insured, nor any precautions he may have taken to make her sea-worthy, will avail him against the breach of his implied warranty. If the ship be not sea-worthy, the policy will be void, though both the insured and the captain believed her to be sea-worthy; and though the insurers knew the state she was in as well as the owners. Where the goods insured have sustained a damage in the voyage, from the insufficiency of the ship, the question, whether the owner or master of the ship be liable to make good the loss, depends on the question whether the ship was in a condition to perform her voyage at the time of her departure, or became defective from stress of weather and the perils of the sea. But it is sufficient if the ship be sea-worthy at the time of her sailing. She may cease to be so in twenty-four hours after her departure, and yet the underwriters will continue liable. The question, however, in such cases, will always be, whether her disability arose from any defect existing *before* her departure, or from a cause which occasioned it *afterwards*. But if a ship, within a day or two after her departure, become leaky and foundered at sea, or be obliged to put back, without any visible or adequate cause to produce such an effect, the natural presumption is, that she was not sea-worthy when she sailed; and it will then be incumbent on the insured to shew the state she was in at that time.

It is unnecessary to make any *representation* of the condition of the ship to the insurer, previous to the effecting of the policy; for it is a rule that no representation need be made of matters relating to the risk which are covered by a warranty.

But a ship, to be sea-worthy, must not only be tight, staunch, and strong, and provided with all necessary stores for the voyage proposed; it is, as has been already observed, a condition or warranty, implied in the contract, that the ship shall be properly *manned*, by persons of competent skill and ability to navigate her. And therefore, if she be suffered to sail in a river, or other place of difficult navigation, without a pilot properly qualified, the underwriters will be discharged; for this is a breach of the above condition. Marshall's Treatise on Insurance, vol. ii. See SHIP and WARRANTY.

SEA-Wrack, the name by which the sea-weed, collected and prepared for manure, is known in some places. See SEA-Weed and WRECK.

It is said to be fed upon by sheep and black cattle, in some places; eating it from the rocks on which it grows, in its saltiest state, during the ebbing of the tides. As a manure, it is often used fresh with earth and sand in a sort of compost, without any loss.

SEA-Yoke. See YOKE.

SEA, Head. Sea HEAD Sea.

SEA, High. See HIGH.

SEA, Lie under the. See LYING.

SEA, Pacific. See PACIFIC.

SEA, Reflux of the. See REFLUX.

SEA, Trough of the. See TROUGH.

SEA, Under the. See UNDER.

SEA, in Geography. See CEA.

SEA of Kubbeer, *Deria Kubbeer*, a salt lake, or rather marsh, of the Persian empire, in the province of Irak; which runs from east to west about 150 miles, being in some places upwards of 35 miles in breadth. The roads through this morass are not easily distinguished; and the unfortunate wanderer runs the risk of either perishing in the swamps, or dying of thirst and heat.

SEABANKORI, a town of Asiatic Turkey, in the province of Natolia; 8 miles S.W. of Kiangari.

SEABASTICOCK, a river of the province of Maine, which runs into the Kennebeck, N. lat. 44° 36'. W. long. 69° 45'.

SEABROOK. See SAYBROOK.

SEABROOK, a township of New Hampshire, in Rockingham county; 6 miles N. of Newbury Port; incorporated in 1768, and containing 776 inhabitants.

SEADEE, a town of Hindoostan, in Bahar; 15 miles S.W. of Arrah.

SEAFORD, a borough and market-town in the hundred of Flexborough, rape of Pevensey, and county of Sussex, is situated at the distance of 46 miles E. by S. from Chichester, and 59 miles S.S.E. from London. It was formerly a large town, and had four churches and chapels; but is now only a small fishing place, defended by a weak fort, "erected rather for political than military purposes." Seaford sent members to parliament as a borough from the reign of Edward I. to that of Edward IV., when it ceased to exercise that privilege, till restored and made a member of the town and port of Hastings by Charles I. The corporation consists of a bailiff, twelve jurats, and an indefinite number of freemen. The bailiff is the returning officer at elections, some of which have been contested with great virulence, and have been the subjects of parliamentary investigation. By the last decision (19th March 1792), the right of election was declared to be "in the inhabitants housekeepers of the said town and port, paying scot and lot, and in them only." The market-day here is Saturday, and there are two annual fairs on the 13th March and the 25th July. According to the population census of 1811, Seaford contained 162 houses, and 1001 inhabitants. History of the Boroughs of Great Britain, 3 vols. 8vo. 1793. Beauties of England and Wales, vol. xiv. by N. Shoberb, 1813.

SEAFORTHIA, in *Botany*, so named by Mr. Brown, in honour of Francis lord Seaforth, F.R.S., F.L.S., and F.R.S. Ed., late governor of Barbadoes, a liberal and very intelligent cultivator and patron of botany, who has enriched the gardens of Britain with numerous West Indian rarities, and whose recent death is justly deplored by all who have a due respect for talents or virtue.—Brown Prodr. Nov. Holl. v. 1. 267.—Class and order, *Polygamia Monoecia*. Nat. Ord. *Palme pennatifoliae*.

Eff. Ch. Calyx deeply three-cleft. Corolla deeply three-cleft. Stamens numerous. Germen with one seed. Stigmas three. Berry oval. Seed striated. Albumen sinuous. Embryo at the base.

Some flowers have an abortive pistil; other intermediate solitary ones are entirely female.

1. *S. elegans*. Elegant Seaforthia.—Observed by Mr. Brown in the tropical part of New Holland. A large and handsome palm, with pinnate leaves; the leaflets plaited and folded, jagged at the extremity. The genus is allied to CARYOTA (see that article), but essentially different in

the structure of the germen, and situation of the embryo.

SEAGAN, in *Geography*, a town of Persia, in the province of Irak; 30 miles E.N.E. of Hirabad.

SEAGRIM, the common name sometimes given to a troublesome field weed. See RAGWORT.

SEAH, in *Jewish Antiquity*, a measure of capacity containing six eabs. See CAB and MEASURES.

SEA-HORSE ISLAND, in *Geography*, an island in Hudson's bay. N. lat. 62°. W. long. 92° 50'.

SEA-HORSE Point, a cape on the east of a peninsula in Hudson's bay. N. lat. 64°. W. long. 82° 10'.

SEAKONNET ROCKS, rocks on the coast of Rhode island, in the entrance of Naragansett bay.

SEAL, SIGILLUM, a punchcon, or piece of metal, or other matter, usually either round or oval, on which are engraven the arms, device, &c. of some prince, state, community, magistrate, or private person, often with a legend or inscription; the impression of which in wax serves to make acts, instruments, &c. authentic.

The king's great seal is that by which all patents, commissions, warrants, &c. coming from the king are sealed: this consists of two impressions, one being the seal itself, with the effigies of the king stamped upon it; the other has an impression of the king's arms in the figure of a target, for matters of smaller moment, as certificates, &c. that are usually pleaded *sub pede sigilli*.

The keeping of this seal is in the hands of the lord high chancellor, who is hence also denominated *lord keeper*.

The office of lord chancellor, or lord keeper, whose authority by 5 Eliz. c. 18. is declared to be exactly the same, is with us at this day created by the mere delivery of the king's great seal into his custody, without writ or patent.

The king's privy-seal is a seal usually first set to grants that are to pass the great seal. See PATENTS.

The use of seals is very ancient, an instance of which occurs in Daniel, chap. vi. 17. But seals are still older than this; for Jezebel, in 1 Kings, chap. xxi. seals the orders she sent for Naboth's death with the king's ring. See also Jerem. xxxii. 10, &c.

In effect, as the ancient seals were all engraven on the collets, stones, &c. of rings, and as the original use of rings, it is asserted, was only to be in readiness for the sealing of acts, instruments, &c. seals should seem to be as ancient as rings themselves.

These sealing rings, called *annuli signatorii*, *sigillares*, *cirographi* or *cerographi*, it is said by ancient authors, were first invented by the Lacedæmonians, who, not content to shut their chests, armories, &c. with keys, added seals to them; and to this end, at first they made use of worm-eaten wood, the impressions of which they took on wax, or soft earth; but they at length found the art of engraving figures, or rings, the impressions of which they took in the same manner. This, however, must be granted, that even in Moses's time, the art of engraving, not only on metals, but also on precious stones, was known.

Indeed, it does not appear that the ring had any other use among the primitive Jews besides ornament: but at length it was used to seal instruments, contracts, diplomas, letters, &c. instances of which we have in the first book of Kings, xxi. 8. Esther, viii. 10. Xenophon, Hellen. lib. i. Quint. Curt. lib. vi. Just. lib. xliii. cap. iii. where we learn, the keeping of the emperor's seal was become a particular office. Lucian adds, that Alexander gave his seal to Perdiccas, thereby appointing him his successor.

Pliny observes, that in his time there were no seals used

any where but in the Roman empire. At Rome, he tells us, they were become of absolute necessity, insomuch that a testament was null without the testator's seal, and the seals of seven witnesses; but it does not appear that the Romans had any such things as public seals; nor that their edicts and contracts were sealed, not even in the times of the emperors.

In France the custom anciently was, instead of signing their instruments, &c. only to seal them; as appears from an infinity of ancient charters, which are not signed at all; the reason of which was, that in those days very few people were able to write; scarcely any body, indeed, could read and write but clerks; and the custom continued when learning made its way among them, though the reason for doing it had ceased.

In England, the first sealed charter we find extant is that of Edward the Confessor, upon his founding of Westminster Abbey; yet we read of seals in the MS. history of king Offa.

And sir Edward Coke relies on an instance of king Edwin's making use of a seal about an hundred years before the Conquest; though some have doubted the authenticity of this charter, because it is certain that sealing was not then in common use.

Before the time of William the Conqueror, the English did not seal with wax, but only made a golden cross on the parchment, and sometimes an impression on a piece of lead, which hung to the grant with a silken string, and was deemed an abundant authorizing of the grant itself, without either signing or witnesses.

This practice of affixing the sign of the cross proceeded from their inability to write; which is honestly avowed by Caedwalla, a Saxon king, at the end of one of his charters: "*propria manu pro ignorantia literarum signum sanctæ crucis expressi et subscripsi.*"

The same circumstance is related concerning the emperor Justin in the East, and Theodoric, king of the Goths, in Italy.

The colour of the wax with which William's grants were sealed, was usually green, to signify that the act continued for ever fresh, and of force. The usual impression on all laymen's seals, till the year 1218, was a man on horseback, with a sword in his hand; afterwards, they began to engrave their coats of arms on their seals; only the archbishops and bishops, by a decree of cardinal Otto, who was legate here in 1237, were to bear in their seals their title, office, dignity, and even their proper names.

Du Chesne observes, that none below the dignity of a knight had any right to a pendant seal, called *authenticum*.

The emperors long sealed all their acts of importance with a golden seal; and the golden bull of Charles IV. for the election of an emperor, takes its name from the gold seal hanging to it, which is called *bull*.

The pope has two kinds of seals, the first used in apostolical briefs, and private letters, &c. called the *fisherman's ring*. This is a very large ring, on which is represented St. Peter drawing his net full of fishes.

The other is used in bulls, representing St. Peter's head on the right, that of St. Paul on the left, with a cross between the two; on the reverse arc sometimes the pope's name and arms.

The impressions of the first seal are taken in red wax; but those of the second, always in lead.

Theod. Hopink, a German lawyer, has furnished the world with a learned and curious work on the subject of seals, printed in 1642, at Nuremberg, in quarto, under the title,

title, "de Sigillorum prisco & novo Jure, Tractatus Practicus," &c. We have another work of the like kind by Heineccius, in folio, printed at Frankfort and Leipzig in 1709, under the title, "de Veteribus Germanorum aliarumque Nationum Sigillis, eorumque Ufu & Præstantia, Syntagma Historicum."

SEAL is also used for the wax or lead, and the impression thereon, fixed to the thing sealed.

The manufacturers' seal, frequently applied to their stuffs, &c. is to be of lead. That of knights, by the French law, is to be of hard wax; that of agents, of soft wax.

Some seals are stamped on the paper or parchment itself, others hung by silken strings.

The French seal their edicts with green wax; arrears with yellow wax; expedients for Dauphiné with red wax. And the letters of the French academy are sealed with blue wax. See WAX.

SEAL, *Hermetical*. See HERMETICAL.

SEAL, *Lady's*, in *Botany*, a species of BRYONY.

SEAL, *Solomon's*, or lily of the valley. See CONVALLARIA.

SEAL, in *Zoology*. See PHOCA, and also SEA-Bear, and SEA-Calf.

SEAL, *Hair of the*, in *Agriculture*, is a substance made use of as a manure, in the way of top-dressing, in combination with rabbits' dung and lime, but which can seldom be provided in any sufficiently large quantity, nor is it found very beneficial for the purpose. See MANURE.

SEAL, in *Geography*, a small island near the coast of Donegal, Ireland, called in Arrowsmith's map Glasheady; it is near the entrance of Strabaghy bay, and about four miles south of Malin Head.

SEAL *Island*, an island near the S.W. coast of Nova Scotia. N. lat. $43^{\circ} 25'$. W. long. 66° .—Also, an island in the Atlantic, near the coast of Maine. N. lat. $43^{\circ} 50'$. W. long. $68^{\circ} 40'$.—Also, a small island W. of King George the Third's Sound, on the S. coast of New Holland; 3 miles N.W. of Baldhead.

SEAL *Islands*, a cluster of small islands in the Atlantic, near the coast of Maine. N. lat. $44^{\circ} 45'$. W. long. $67^{\circ} 46'$.—Also, a cluster of small islands near the east coast of Labrador. N. lat. $53^{\circ} 15'$. W. long. $55^{\circ} 10'$.

SEAL *Key*, a small island in the Spanish Main, near the Mosquito shore. N. lat. $12^{\circ} 54'$. W. long. $82^{\circ} 40'$.—See also LOBOS.

SEAL *River*, a river of North America, which runs into Hudson's bay.

SEALCOTE, a town of Hindoostan, in the country of Lahore; 50 miles N.N.E. of Lahore. N. lat. $31^{\circ} 44'$. E. long. $73^{\circ} 50'$.

SEALER, an officer in chancery, appointed by the lord chancellor, or keeper of the great seal, to seal the writs and instruments there made in his presence.

SEALING, in *Architecture*, the fixing of a piece of wood or iron in a wall, with plaster, mortar, cement, lead, or other solid binding.

For staples, hinges, and joints, plaster is very proper.

SEALING-Wax. See WAX.

SEAM, or SAME, in *Rural Economy*, a term applied to tallow, grease, hog's lard, before it is rendered and formed into lard, &c. in some places.

SEAM, a term applied to a horse-load of three hundred weight. In Cornwall, a seam of sand weighs two hundred weight. The seam also differs very much in the weight of different articles of other kinds. It likewise varies in different districts of the kingdom.

SEAM of *Corn*, in *Agriculture*, the measure of a quarter, or eight bushels.

SEAM of *Glass*, is the quantity of one hundred and twenty pounds, or twenty-four stone, each five pounds weight.

SEAM of *Wood*, in *Rural Economy*, a horse-load of wood, or as much as can be carried by a strong animal of that kind. It differs, however, in different districts.

SEAMS, or SEYMS, in *Horses*, certain clefts in their quarters, occasioned by the dryness of the foot, or by riding upon hard ground.

SEAMS, in *Ship-Building*, the openings or joints between the edges of the planks when wrought.

SEAMS, in *Sail-Making*. Sails have a double flat seam, that is, the edges or selvages of the canvas are lapped one over the other an inch or more, and both edges firmly sewed down.

SEAMS of a *Sail* are of two sorts, *monk's-seam*, and *round-seam*.

SEAM, *Monk's*. See MONK.

SEAM, *Round*, of a sail, is so called, because round like the common seam.

SEAMEN. See MARINERS and NAVY.

SEAMER, in *Geography*, a river of England, in the county of York, which runs into the Ure.

SEAMER'S *Lake*, a lake in America, in the state of Vermont. N. lat. $44^{\circ} 52'$. W. long. $71^{\circ} 55'$.

SEAMLEE, a town of Hindoostan, in the circle of Schaurunpour; 36 miles S. of Schaurunpour.

SEA-OTTER SOUND, a bay on the W. coast of North America. N. lat. $55^{\circ} 40'$. W. long. $133^{\circ} 45'$.

SEA-PYES' KEYS, a cluster of small islands in the gulf of Mexico. N. lat. $29^{\circ} 56'$. W. long. $89^{\circ} 5'$.

SEAR, in *Rural Economy*, a term applied to dry or rotten wood, in opposition to that which is green.

SEARA, in *Geography*, a town of Brazil, in the government of Maranhao. S. lat. $3^{\circ} 30'$. W. long. $39^{\circ} 30'$.—Also, a river of Brazil, which runs into the Atlantic, S. lat. $3^{\circ} 30'$. W. long. $39^{\circ} 30'$.

SEARCE. See SIEVE.

SEARCH-Warrant, in *Law*, a kind of general warrant issued by justices of peace, for searching all suspected places for stolen goods; and there is a precedent in Dalton, requiring the constable to search all such suspected places, as he and the party complaining shall think convenient; but such practice is condemned by lord Hale, Mr. Hawkins, and the best authorities. However, in case of a complaint, and oath made of goods stolen, and that the party suspects that the goods are in such house, and shews the cause of such suspicion, the justice may grant a warrant to search in those suspected places mentioned in his warrant, and to attach the goods, and the party in whose custody they are found, and bring them before him or some other justice, to give an account how he came by them, and to abide such order as to law shall appertain; which warrant should be directed to the constable, or other public officer, who may enter a suspected house and make search.

SEARCHER, an officer in the customs, whose business it is to search and examine ships outward bound, if they have any prohibited or uncustomed goods on board, &c. 12 Car. II. There are also searchers of leather, &c. See ALNAGER.

SEARCHER, in *Artillery*, is an iron socket with branches, from four to eight in number, a little bent outwards with small points at their ends; to this socket is fixed a wooden handle, from eight to twelve feet long, of about an inch and a quarter diameter. This searcher is introduced into the gun after it has been fired and turned round, in order to discover

cover the cavities within; and after their distances are marked on the outside with chalk, they make use of another searcher that has only one point, about which a mixture of wax and tallow is put, to take the impression of the holes; and if there are any a quarter of an inch deep, or of any considerable length, the gun is rejected as unferviceable to the government. The gun is thus proved and searched twice.

SEARCHER, in *Rural Economy*, an implement used for boring in searching for coals, &c. See **BORER**.

SEARCHING, the operation of boring or sinking into the bowels of the earth, for the discovery of the different materials which it may contain. For the detection of marles, coals, or other similar substances, the use of the borer may be sufficient. But where difficulties arise in performing it in this way, from the obstruction of stones, &c. a narrow shaft, such as a well, may, Mr. Marshall thinks, be carried down, without much expence, to the depths at which it can be wrought with advantage. See **BORER** and **MARLE**.

SEARCHING of Neutral Ships, in *Political Economy*, a practice authorized by the law of nations, in order to prevent the commerce of contraband goods, or such commodities as are particularly used in war, and the importation of which to an enemy is prohibited. Accordingly Vattel, and other writers of the same description, maintain that there is a right of searching. Some powerful nations have indeed at different times refused to submit to this. But at present a neutral ship refusing to be searched, would from that proceeding alone be condemned as lawful prize. But to avoid inconveniencies, violence, and every other irregularity, the manner of the search is settled in the treaties of navigation and commerce. According to the present custom, credit is to be given in certificates and bills of lading, produced by the master of the ship, unless any fraud appear in them, or there be very good reasons for suspecting their validity.

SEARCHING for the Stone, called also *sounding*, denotes, in *Surgery*, the operation of introducing a metallic instrument, named a sound, through the urethra into the bladder, with a view of ascertaining whether a stone is really lodged there or not. In this manner, the surgeon actually makes the instrument strike against any calculus which may be present; and the collision produces such an impression on the fingers of the surgeon, and on the ears of every bystander, as leaves no doubt respecting the matter of the case. Sounding is in fact the only infallible way of learning that the bladder contains a stone. The symptoms of the complaint resemble those of several other diseases, and may deceive us (see **LITHOTOMY**); but when we both hear and feel the collision of the instrument against the calculus, we obtain that kind of information which does not admit of error.

The most advantageous posture for founding is that, in which the patient reclines back upon a sofa, or couch. A chair of large size, with a back that can be made to fall backwards to a convenient distance, is sometimes used, and may be seen in most of our hospitals.

As the stone is generally situated at the lowest part of the bladder, the extremity of a sound is usually not so curved as that of a catheter, in order that it may more easily touch any thing situated immediately behind and below the neck of the bladder. The sound is only a particular kind of probe, and as its chief use is to convey information through the medium of the organ of touch, its handle should be smooth and highly polished, so that as many points of its surface as possible may come into contact with the fingers.

The sound is introduced exactly in the same manner as the silver catheter, either with the concavity or convexity

of the instrument towards the abdomen. When the last method is preferred, as soon as the point has arrived in the perinæum, it is to be kept stationary, while the handle is made to describe a semicircular movement downward, so as to turn the concavity of the instrument towards the pubes, previous to its passage through the membranous and prostatic portion of the urethra. This is the plan which the French surgeons have called "le tour de maitre."

When the extremity of the sound is in the bladder, it is to be pushed downward for the purpose of ascertaining whether the stone lies beneath its convexity, as is most commonly the case where one is present. If the extraneous body should not be felt in this manner, the beak of the instrument may be turned first to one side of the cavity of the bladder, then to the other. Should the calculus not be touched by these movements of the sound, the instrument may be drawn forward, for the purpose of learning whether the stone is more anteriorly situated. Frequently the stone cannot be felt till the whole of the urine has been expelled, and the bladder has become contracted. Sometimes, the sound may be made to hit the stone, by introducing the finger into the rectum, and thus bringing the extraneous body upward. In this way, the calculus may often be plainly felt by the finger.

We shall conclude this short article, with earnestly cautioning surgeons never to perform lithotomy, unless they can distinctly feel the stone with the sound, or staff, immediately before the operation.

SEAR-CLOTH, or **CERE-CLOTH**. The word *sear-cloth* is supposed to be a corruption of *cere-cloth*, and to be derived originally from the Greek *κνρ*, *wax*.

In *Surgery*, it denotes a form of external remedy, somewhat harder than an unguent, yet softer than an emplaster, though it is frequently used both for the one and the other.

The sear-cloth is always supposed to have wax in its composition, which distinguishes, and even denominates it. In effect, when a liniment or unguent has enough wax in it, it does not differ from a sear-cloth.

Sear-cloths are a kind of substitutes to friction, and are sometimes used for other purposes; the best are compounded of resolvent drugs, as saffron, myrrh, and aloes, incorporated with wax and gums, as galbanum, gum ammoniac, and sagapenum; the whole tempered with wine.

SEARSBURG, in *Geography*, a township of America, in Bennington county, Vermont; 12 miles E. of Bennington.

SEASE, **SEASIN**, or *Seasing*, in a *Ship*. See **SEIZE**.

SEASONING, in *Ship-Building*, a term applied to a ship kept standing a certain time after she is completely timbered and dubbed out for planking, which should never be less than six months.

Seasoned timber or plank is such as has been cut down and converted, or sawn out one season at least, particularly when thoroughly dry, and not liable to shrink.

SEASONING of Timber. See **TIMBER**.

SEASONINGS, in the West Indies, a kind of aguifh distemper, which foreigners are much subject to at their first coming.

SEASONS, in *Cosmography*, certain portions or quarters of the year, distinguished by the signs which the sun then enters, or by the meridian altitudes of the sun; consequent on which, are different temperatures of the air, different works in tillage, &c.

The word is formed from the French *saïson*, which Menage derives from the Latin *statio*, whence the Italians have formed *stagione*; Nicod derives it from *satio*, *tempus sationis*, *sowing time*.

The year is divided into four seasons, spring, summer, autumn, and winter; the beginnings and endings of each of which, see under its proper article.

It is to be observed, the seasons anciently began differently from what they now do; witness the old verses:

“Dat Clemens hyemem; dat Petrus ver cathedratus;
Æstuat Urbanus; autumnat Bartholomæus.”

SEAT, in *Astronomy*. See SCHEAT.

SEAT, in the *Manege*, is the posture or situation of a horseman upon the saddle.

To seat a horse upon his branches or hip, see PUT.

SEAT, in *Ship-Building*, the scarf or part trimmed out for a *chock*, &c. to lay to.

SEAT-Transom, that transom which is fayed and bolted to the stern-timbers, next above the deck-transom, at the height of the port-hills.

SEATING, that part of a floor which fays on the *dead-wood*; and of a transom which fays against the post.

SEATNESS, in *Geography*, a cape on the S.W. coast of Shetland. N. lat. $59^{\circ} 46'$. W. long. $1^{\circ} 36'$.

SEATON, a small sea-port town in the hundred of Colyton, county of Devon, England, is situated at the distance of three miles S. from Colyton, and 156 S.W. from London. This place is called Suetetone in Domesday book, and was undoubtedly the Moridunum of the Iter of Antoninus. Rishon says it is “memorable for the Danish princes landing there in the year 937, as also for the attempt of the inhabitants of Colyton to make a haven there, which they had solemnly named Collyton haven, and procured a collection under the great seal of England for the levying of money to effect the same, of which work there remaineth no monument, only a remembrance of such a place among strangers that know not where it stands.” At present Seaton is chiefly noted as a well frequented sea-bathing village. The church is an ancient building of free-stone, dedicated to St. Gregory, and contains a very elegant monument in memory of W. Walrond, esq. and his lady. According to the parliamentary returns of 1811, the parish of Seaton comprised 323 houses, and 1524 inhabitants. The History of Devonshire, by the Rev. Richard Polwhele, three vols. folio, 1797. The Chorographical Description or Survey of the County of Devon, by Tristram Rishon, 8vo. 1714, 2d edit. with additions, 8vo. 1811.

SEATON, or *Port Seaton*, a small sea-port of Scotland, in the county of Haddington, in the Frith of Forth; 5 miles W.N.W. of Haddington. N. lat. $55^{\circ} 58'$. W. long. $3^{\circ} 59'$.

SEATON Nook, a cape of England, on the E. coast of the county of Durham, at the mouth of the Tees; 5 miles S.S.E. of Hartlepool.

SEATON Sluice, a sluice which opens into the German sea, on the coast of the county of Northumberland.—Also, a town of England, called “Seaton Delaval,” in Northumberland, deriving its name from an artificial harbour constructed by sir Ralph Delaval, in the 17th century; 10 miles N.E. of Newcastle. N. lat. $55^{\circ} 6'$.

SEATON, a river of England, which rises near Lestkeard, and runs into the English Channel, three miles E. of Looe, in Cornwall.

SEAVES, in *Rural Economy*, a term used to signify rushes, especially the soft rush.

SEAVY GROUND, such ground as is covered or over-run with rushes.

SEAUM, in *Geography*, a town of Hindoostan, in Lahore; 18 miles W. of Rahoon.

SEA-WOLVES ISLAND, an island in the gulf of St.

Laurence, near the W. coast of Cape Breton. N. lat. $46^{\circ} 21'$. W. long. 61° .

SEBA, ALBERT, in *Biography*, a native of East Friseland, was by profession a druggist at Amsterdam, and a member of the Academy Naturæ Curioforum. He published a descriptive catalogue, in Latin and French, of the vast collection of objects in natural history which he had brought together, in four vols. folio, illustrated with a great number of engravings. He likewise communicated several papers to the Ephem. Nat. Curiof.

SEBACA, in *Geography*. See MARIOUT.

SEBACEOUS GLANDS, in *Anatomy*, small glandular bodies in the skin, secreting the unctuous matter which covers the surface of the body. They are particularly manifest about the alæ of the nose, and in the folds of the external ear. See INTEGUMENTS, EAR, and NOSE.

SEBACIC ACID, in *Chemistry*, is an acid produced from the decomposition of animal fat, particularly hog's-lard. The acrid fumes which are evolved during the burning of fat at a heat short of inflammation, was formerly considered as a peculiar acid, which was called the acid of fat, and afterwards the sebatic acid. From the experiments of Thenard it has since been proved not to be a peculiar acid, but the acetic acid disguised with some other product of the decomposition. During these researches, however, he found that by the distillation of tallow, he obtained an acid having peculiar properties, which he still called the sebatic acid. The following is the process he recommends. Distil hog's-lard from a retort, by a heat which will decompose the fat; carbonic acid and carburetted hydrogen first come over, and a yellowish fluid containing acetic acid, but still no sebatic acid. This receiver must now be removed, and a new one adapted: the heat being continued, an oily matter comes over of the consistence of butter. It is in this substance that the sebatic acid is found. It is separated by first boiling it in water, and evaporating the liquid till the sebatic acid falls down in crystals. This deposition is increased as the liquid cools.

He also recommends, instead of getting the crystals by evaporation, to add acetate of lead to the water in which the oily matter has been boiled; a flaky precipitate is formed, which is the sebat of lead, and which is to be well washed and dried. When to this substance sulphuric acid is added, and heat applied, a fatty liquid floats on the top, which is to be collected; this being dissolved in hot water, forms crystals of pure sebatic acid, which are deposited on cooling.

The lard affords but a very small proportion of the acid. Rose informs us that it requires a pound of lard to produce forty grains of acid.

Sebatic acid, thus obtained, is in the form of a crystalline mass, of a white colour. It has no smell, but its taste is agreeably sour, and slightly bitter; like most other acids it changes some vegetable blues to a red colour.

When heated, it melts like fat into a transparent fluid, but on cooling it re-assumes its whiteness and its crystalline form. It is said to be volatile by heat, still retaining its properties, but a strong heat decomposes it.

It is sparingly soluble in cold water, and boiling water dissolves about one-fourth its weight; it affords crystals on cooling, which are in the form of prisms. Alcohol dissolves it in considerable quantity. It is also soluble in oils. From the last, and some other properties, it bears a strong resemblance to the benzoic acid. This last analogy has been pointed out by Berzelius. He found also that the salts formed by this acid have a strong resemblance to the *benzoates*. These facts go far to shew so strong an analogy between the two

two acids, as almost to establish their identity. See BENZOIC Acid.

SEBACOOK, or SEBAGO, in *Geography*, a pond or lake of America, in the state of Maine, equal in extent to two large townships, and connected with Long Pond on the N., W. by Sungo or Songo river; these waters reach nearly 30 miles from N.W. to S.E.; 18 miles N.W. of Portland.

SEBÆA, in *Botany*, a name adopted by Mr. Brown, from Dr. Solander's manuscripts, in memory of Albert Seba, an apothecary of Amsterdam, who prepared a splendid description, with plates, of his own museum, in four large folio volumes, which came out between the years 1734 and 1765. The author indeed died in 1736, so that his three latter volumes were posthumous publications. Many Cape plants are here engraved, and amongst them one of the present genus. Yet Seba does not deserve to rank as a scientific botanist, nor did Linnæus, who knew him, and by whose recommendation he employed Artedi to arrange his fishes, ever think him worthy to be commemorated in a genus. If, however, we compare him with numbers who have been so commemorated, he will not appear to so much disadvantage; for as a collector he stands rather high. Brown *Prodr. Nov. Holl.* v. 1. 451.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Rotaceæ*, Linn. *Gentiana*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, deeply divided into four ovate, acute, keeled, slightly spreading, permanent segments, folding over each other at the base. *Cor.* of one petal, withering, salver-shaped; tube swelling, the length of the calyx, contracted at the upper part; limb in four deep, elliptical, spreading segments. *Stam.* Filaments four, thread-shaped, inserted into the tube, projecting out of its mouth; anthers erect, shorter than the limb, oblong, bursting longitudinally, subsequently recurved and callous at the tip. *Pist.* Germen superior, roundish, filling the tube; style thread-shaped, erect, the length of the filament; stigmas two, oblong. *Peric.* Capsule roundish, with a furrow at each side, compressed, of two cells and two valves, the length of the calyx; partitions from the inflexed margins of the valves, inserted into the edges of the large central receptacle, from which they finally separate. *Seeds* numerous, minute.

Obs. The flowers in some species are five-cleft.

Ess. Ch. Calyx deeply four-cleft, keeled. Corolla salver-shaped, with an inflated tube. Anthers bursting longitudinally; finally recurved and callous at the point. Capsule with two furrows, two cells and many seeds; the partition from the inflexed margins of the valves. Stigmas two.

Mr. Brown has separated the present genus from *Exacum*, whose genuine species, according to him, are *E. sessile* and *pedunculatum* of Linn. Sp. Pl. with which the *albens* and *cordatum* of the Supplementum are, in the last-mentioned work, confounded. (See EXACUM.) Perhaps also, as Mr. Brown conceives, *E. punctatum* of the said work may make a third, and a nondescript East Indian one in his possession a fourth, species. He considers as essential to *Exacum* a less-deeply divided calyx; anthers without a callous tip, bursting by a pore, or short slit, and continuing straight after the flowers fade; style declining; an undivided stigma; and receptacle of the seeds connected with a partition originating from the middle of each valve.

1. *S. albens*. Whitish Sebæa. (*Exacum albens*; Linn. Suppl. 123. Willd. Sp. Pl. v. 1. 634. but not *E. pedunculatum*, Sp. Pl. 163. *Centaureum subrotundis foliis, floribus comosis*; Burm. Afr. 207. t. 74. f. 4; excluding the reference to Plukenet.)—Flowers in the upper forks of the stem sessile.—Gathered by Thunberg, Sparrmann, and

others at the Cape of Good Hope. The root is annual, fibrous. Stem erect, four or five inches high, much branched, repeatedly forked, leafy, smooth, with four sharp angles, level-topped, many-flowered. Leaves sessile, scarcely at all decurrent, ovate, entire, smooth, fleshy, somewhat glaucous. Flowers four-cleft, though Burmann describes them otherwise; the lowest more or less stalked, as well as those which crown the ultimate lateral branches; but those situated in the upper forks of the stem are quite sessile. Segments of the calyx slightly keeled, their points a little recurved. Corolla apparently whitish, or pale pink. Thunberg's specimen agrees best with Burmann's figure; that of Sparrmann has broader leaves and larger flowers; yet we cannot trace out a satisfactory distinction. One of them may possibly be the unpublished Cape species, announced by Mr. Brown, without any definition or description, but we cannot guess which, and, all things considered, we do not feel authorized in separating them.

2. *S. aurea*. Yellow Sebæa. (*Exacum aureum*; Linn. Suppl. 123. Willd. Sp. Pl. v. 1. 635. *Centaureum minus aureum, flosculus numerosis, æthiopicum*; Pluk. Almag. 94. t. 275. f. 3.)—All the flowers stalked.—Gathered by Sparrmann, at the Cape of Good Hope. About half the size of the last in every part. Flowers yellow, four-cleft, each on a slender quadrangular stalk, even from the uppermost, as well as the lower, forks of the stem. Linnæus justly commends Plukenet's figure, though he had originally, in Sp. Pl. cited that synonym doubtfully under his *Exacum sessile*, a widely different plant. It is remarkable that he describes the calyx in the Supplement as of five leaves, whereas it has only four, as it ought, the corolla being five-cleft.

3. *S. cordata*. Heart-shaped Sebæa. (*Exacum cordatum*; Linn. Suppl. 124. Willd. Sp. Pl. v. 1. 636. But not *E. sessile*, Sp. Pl. 163. *Gentiana exacoides*; Linn. Sp. Pl. 332. *Centaureum perfoliatum, florum calyce membranaceo ventricoso*; Burm. Afr. 208. t. 74. f. 5. *C. perfoliatum æthiopicum, flosculus exiguis flavescens*; Pluk. Almag. 94. t. 275. f. 4. "*C. capense minus, capsula quatuor alis donata*; Seb. Mus. v. 1. t. 22. f. 7.")—Flowers five-cleft. Segments of the calyx with a dilated, half-heart-shaped, veiny keel. Leaves heart-shaped.—Native of the Cape of Good Hope. The size and habit agree with the first species, but the flowers are larger, apparently yellow, with a longer tube, and five-cleft limb. Calyx distinguished by the dilated veiny keels of its segments, which are five, not (as Plukenet and Seba say,) four only. All the flowers have partial stalks, though shorter in the upper ones than the lower. The whole history of these three species, in the Supplement, was written by Linnæus himself, not by his son, who only described the fourth, *Exacum punctatum*.

4. *S. ovata*. Ovate Sebæa. Brown n. 1. (*Exacum ovatum*; Labill. Nov. Holl. v. 1. 38. t. 52.)—Flowers five-cleft. Segments of the calyx simply keeled. Leaves ovate.—Gathered by M. Labillardiere at Cape Van Diemen, and by Mr. Brown at Port Jackson, New South Wales. Taller and more slender than the foregoing, being about a span high. Such of the upper flowers, as grow from the forks of the stem, are nearly sessile, like those of *S. albens*. Segments of the calyx lanceolate, with a simple, not dilated, keel. Corolla with a small, short, five-cleft limb; nothing is recorded of its colour.

SEBAGENA, in *Ancient Geography*, a town of Cappadocia, in the prefecture of Cilicia. Ptolemy.

SEBAIA, in *Geography*, a town of Arabia, in the province of Hedsjas; 33 miles S. of Medina.

SEBAKET BARDOIL, *i. e.* the lake of king Baldwin, a narrow lake of Egypt, near the Mediterranean, about fifteen miles long; 2 miles E. of Catieh.

SEBALA, a town of Arabia, in the province of Heds-jas; 27 miles S. of Medina.

SEBAMA, or SABAMA, in *Ancient Geography*, a town of Palestine, on the other side of the Jordan, in the tribe of Reuben, according to the book of Joshua.

SEBANZARRO, in *Geography*, a town of Abyflinia; 80 miles E.N.E. of Axum.

SEBAR, or CEBAR, in the *Materia Medica*, a name by which the Arabians call the *lignum aloes*, or *aloe-wood*, a perfumed aromatic drug.

SEBARIMA, in *Geography*, one of the mouths of the river Oroonoko.

SEBATACOOK, a river of America, in the state of Maine, which rises in lakes nearly N. from its mouth, and after receiving, in the windings, many tributary streams, joins the Kennebeck at Taconnet Fall, where Fort Halifax was erected, in 1754; the fall is 18 miles from Fort Western, which was constructed in 1752. Its numerous streams abound with small fish.

SEBASTE, a miserable deserted village of Syria, the depopulated remains of Samaria, which acquired its new name in honour of Augustus Cæsar; 34 miles N.N.E. of Jerusalem. See SAMARIA.

SEBASTE, in *Ancient Geography*, an island and town of Cilicia Propria, on the other side of the promontory of Corycus. Strabo says that this town was called Eleusa, and that Archelaus made it the place of his residence, when Augustus gave him Cilicia Trachea.—Also, a town of Asia Minor, in Phrygia.—Also, a town of Asia Minor, in Galatia.

SEBASTIAN, in *Biography*, king of Portugal, was the posthumous son of the infant John, by Joanna, daughter of the emperor Charles V. He succeeded to the crown at three years of age, on the death of his grandfather, John III., in the year 1557. By his education he acquired an extravagant admiration for valourous exploits, and an enthusiastic zeal against all the foes of the Christian religion. Under the influence of this passion, he, at the age of twenty, undertook a sudden expedition to Africa, in which, however, he performed nothing of any importance; but availing himself of the application for aid of Muley Hamet, king of Fez and Morocco, who had been dispossessed of his crown by his uncle Muley Moloch, he resolved to renew the attempt against the Moorish monarch with all the force he could bring together.

In vain was he dissuaded from the enterprize: he was inaccessible to all admonitions. Having stripped his country of its military strength, and the flower of the nobility, he set sail in the summer of 1578, and proceeded to Arzilla. There he was met by a much more numerous army, with Muley Moloch in person, who was so debilitated by sickness that he was carried in a litter. In the battle that ensued, the onset of the Portuguese army was so furious that nothing could withstand them, and Muley, in rallying his men, was so much exhausted that he died in the attempt. Sebastian, who was not less dexterous in the use of arms than brave, fought till two horses were killed under him, and most of his attendants were slain by his side. At length, however, he disappeared, nor was it ever known, with any degree of certainty, what became of him, though a body, supposed to be his, was received as such from the Moors, and interred at Belem. But in a slaughter so dreadful, that not more than fifty of the Portuguese army are said to have escaped, it is no wonder that a single body, and probably stripped, should not be recognized. Such, however, was the attachment of

the nation to a prince, whose romantic valour had revived in their minds the heroic times of Portugal, that they refused to give credit to his death, and long entertained the full expectation of seeing him return from his supposed concealment. Of this opinion many impostors availed themselves, who assumed his character, and obtained a portion of respect due to their favourite sovereign: for more than a century it was believed that he would be again seated on his throne.

SEBASTIAN, *St.*, in *Geography*, a town of Spain, and the most important of the district of Guipuscoa, situated on the coast of ancient Cantabria, now Basque, between two arms of the sea, which form a peninsula of it, and at the mouth of the little river Urumea, or Gurumera, which was the Menascum of the ancients. On the sea-side there is an eminence which serves as a dike. This town, flanked with bastions and half-moons, appears defended by a castle or citadel of little importance, placed upon an almost circular and tolerably high mountain, which is bare, without trees, almost smooth, and ascended by a spiral road. St. Sebastian has a small harbour inclosed by two moles, that leave a very confined space for the passage of ships, which are afterwards protected from the winds, on arriving at the bottom of an eminence of rocks which covers this harbour, where there is a large square tower; it holds at most five and twenty or thirty vessels. The town is very airy; it contains twenty streets, several of which are straight, long, and broad, and all paved with large smooth stones. There are from six hundred and fifty to seven hundred houses in it, and many of them are pleasant enough. It is the residence of the governor of the province, who had the title of captain-general until the beginning of the present century. It has a governor, a king's lieutenant, a major, an aide-major, a small garrison, and a naval academy; two parishes, and a third in the suburbs, which are very populous; two convents of monks, three convents of nuns, and an hospital. There are in this town and its suburbs five manufactories of hides and leather, some tanning-yards established in the faubourg St. Martin, a manufactory of anchors for the royal navy in the faubourg of Sta. Catalina, and rope-walks, where cables are made.

Saint Sebastian has always carried on a considerable trade. In 1728, the Philippine company was formed by Philip V., with which that of the Caraccas was afterwards united. This company was very serviceable, as it procured for Spain a lucrative branch of trade, which was in the hands of the Dutch. In consequence, however, of mal-administration, and the loss of 1,500,000 piastres, which it sustained at the commencement of the war between England and America, this company sunk and was suppressed. However, a trade with the province of Caraccas was continued by private merchants from this port, and the cocoa, tobacco, and leather which are from thence imported, form no inconsiderable branch of trade with the interior and the other parts of Spain, and a still more important one with foreign countries. Hence its harbour is very much frequented by English, Dutch, French, and other ships. It receives the produce of foreign industry, and returns, in exchange, iron anchors, cables, leather, wool, and sometimes cotton. This trade attracts a considerable population to the town, which is estimated at 13,000 inhabitants.

The port of St. Sebastian, though free, is not what is called *abilitado*. This word means a privilege to send merchandize directly to America.

The environs of St. Sebastian are pleasant, though the soil is sandy; we enjoy at the same time a view of the sea and of the Pyrenees. Those who love the country, take pleasure in visiting the pleasant valley of Layola. We go to

to it through the gate of France, following a kind of promenade, which leads to a wooden bridge, where persons who are fond of it amuse themselves in fishing for salmon, in a river which bathes the fortifications of the town; this fish is found there in such abundance, that it is sold for three farthings a pound. As we proceed, we perceive on the left a convent of Franciscans, the whole appearance of which inspires veneration, seeming desirous of concealing itself under masses of foliage, formed by groups of trees. On that side, however, they have begun to form a public promenade parallel to the little road which leads to Passage Port. We travel along a loose soil, which is covered by the high tides; we afterwards ascend and descend, proceeding along a steep coast; the path is shaded by a high wood, and embellished with fragrant jessamines; after crossing another wooden bridge, we enter the valley of Layola. Bounded on one of its sides by hills covered with trees, it here has a gloomy aspect; but on the opposite side we behold the richest productions, displaying a scene of various colours, highly embellished by the rays of the setting-sun. A river bounds this valley in a femicircular form, and waters a great number of fruit-trees planted on its banks.

The sky at St. Sebastian is not very serene, but it is often cloudy; the air is generally damp, and sometimes loaded with fogs. The provisions are cheaper than in most of the other parts of Spain; and here are two tolerably good inns. In 1719 the French made themselves masters of this town; and in 1794, August 3d, it was invested by the republican troops of France, and capitulated the next morning; the garrison, consisting of 2000 men, surrendering themselves prisoners of war, and more than 180 pieces of brass cannon were taken, with considerable magazines and stores. On August the 13th, 1813, it was taken by storm by the British troops; 22 miles W.S.W. of Bayonne. N. lat. $43^{\circ} 10'$. W. long. $2^{\circ} 4'$.—Also, a fort of Africa, in the kingdom of Anta, on the Gold Coast, belonging to the Dutch.

SEBASTIAN, *St.*, or *St. Sebastiao*, a town of the island of Tercera, situated between mountains, about half a mile distant from the sea.

SEBASTIAN, *St.* See *Rio de Janeiro*.

SEBASTIAN *del Oro*. See *La PLATA*.

SEBASTIAN, *St.*, *de SALIR*, a town of Portugal, in Algarva; 6 miles N.W. of Loule.

SEBASTIAN, *St.*, a town of Mexico, in the province of Chiametlan, on the Mazatlan; 45 miles N.N.W. of Chiametlan. N. lat. $23^{\circ} 35'$. W. long. $106^{\circ} 30'$.—Also, a small island in the Atlantic ocean, near the coast of Brazil. S. lat. $23^{\circ} 45'$.—Also, a town of South America, in the province of St. Martha; 10 miles W. of Los Reyes.—Also, a bay of the Indian sea, on the coast of Africa. S. lat. $32^{\circ} 22'$.—Also, an island of Mexico, in Nicaragua lake, with a town near the E. coast. N. lat. $11^{\circ} 48'$. W. long. $85^{\circ} 6'$.—Also, a river of Mexico, which runs into the Pacific ocean, N. lat. $25^{\circ} 20'$.—Also, a town on the E. coast of Gomera, one of the Canary islands. N. lat. $28^{\circ} 5'$. E. long. $17^{\circ} 12'$.—Also, a town of Terra Firma, on the E. side of the gulf of Darien.

SEBASTIAN, *Cape St.*, the eastern point of the gulf of Darien, on the coast of the Spanish Main, 10 leagues from the western point of Cape Tiburon. The city which formerly existed here has been abandoned, on account of its unwholesome situation.—Also, a cape on the coast of California. N. lat. 43° . W. long. 126° .—Also, a cape on the N. coast of Madagascar. S. lat. $11^{\circ} 20'$. E. long. $54^{\circ} 44'$.—Also, a cape on the E. coast of Africa. S. lat. 22° . E. long. $33^{\circ} 20'$.—Also, a cape of Spain, on the E. coast of Catalonia. N. lat. $51^{\circ} 52'$. E. long. $3^{\circ} 0'$.

SEBASTIAN's *Bay, St.*, a bay on the S. coast of Africa. S. lat. $34^{\circ} 40'$. E. long. 21° . It is also called *St. Catharine's bay*.

SEBASTIAN *River, St.*, or *Spanish Admiral's creek*, a river on the E. coast of East Florida, which communicates with Indian river. The admiral of the Plate fleet perished in 1715, opposite to this river, and the rest of the fleet, fourteen in number, were lost between this and the Beach yard.

SEBASTIAN's *Sound, St.*, an inlet in the straits of Magellan, on the coast of Terra del Fuego; 48 miles S. of Sweepstakes foreland.

SEBASTIAN *de Buenavista, St.*, a town of South America, in the province of Carthageua, at the entrance of the gulf of Darien; 140 miles S.S.W. of Carthageua. N. lat. $8^{\circ} 19'$. W. long. $76^{\circ} 40'$.

SEBASTIAN *de los Reyes, St.*, a town of South America, in the government of Caraccas; 60 miles S. of Leon de Caraccas. N. lat. $9^{\circ} 35'$. W. long. $66^{\circ} 56'$.

SEBASTIAO, *St.* See *St. Sebastiao*.

SEBASTIEN, *St.* See *St. Sebastien*.

SEBASTOCRATOR, in *Antiquity*, a title of honour given to some distinguished person of the imperial family. It was introduced by Alexius Comnenus, in order to reward the piety of his brother Isaac, without giving himself an equal. The happy flexibility of the Greek tongue allowed him to compound the names of Augustus and emperor (Sebastos and Autocrator), and the union produced the sonorous title of Sebastocrator. He was exalted above the Cæsar on the first step of the throne; the public acclamations repeated his name; and he was only distinguished from the sovereign by some peculiar ornaments of the head and feet. The emperor alone could assume the purple or red buskins, and the close diadem, or tiara, which imitated the fashion of the Persian kings; instead of red, the buskins of the Sebastocrator and Cæsar were green, and on their open coronets or crowns the precious gems were more sparingly distributed. The five titles of Despot, Sebastocrator, Cæsar, Panhyperchastus, and Protosebastus, were usually confined to the princes of the emperor's blood; they were the emanations of his majesty; but as they exercised no regular functions, their existence was useless, and their authority precarious.

SEBASTOPOLIS, or DIOSCURIAS, in *Ancient Geography*, the name of one of the principal towns of that part of the Colchide which was to the right of the Phasis.—Also, a town of Asia Minor, in the Cappadocian Pontus, on the road from Tavia to Sebastia.

SEBASTOPOLIS, in *Geography*. See SEVASTOPOL.

SEBAT, in *Chronology*, the fifth month of the civil year of the Hebrews, and the eleventh of the ecclesiastical year, answering to part of our January and part of February.

SEBATS, in *Chemistry*, a genus of salts, formed by the union of the sebatic acid with the different saline bases. For an account of these, see the different bases: for instance, for sebat of lime, see LIME; and so on for any other.

SEBBA ROUS, or *Seven Capes*, in *Geography*, a cape or headland on the coast of Algiers, the vicinity of which is occupied by persons of a brutal and ferocious description, who live in caves scooped out of the rocks. These people, called "Kabyles," rush in crowds to the coast when any vessel in distress, or in the course of sailing, approaches it, and vociferate their horrid wishes, that God would deliver it into their hands; and probably the name of "Boujarone," or "Catamites," was first given by the Italian geographers to these capes, on account of the savage disposition of their inhabitants. N. lat. $37^{\circ} 8'$. E. long. $6^{\circ} 32'$.

SEBBAH, a town of Africa, in the country of Fezzan,

60 miles N. of Mourzouk. Here the large remains of an ancient castle, built upon a hill, and of other venerable ruins, that, in point of extent, are compared to those of Lebida, impress on the mind of the traveller the melancholy idea of departed greatness; while, on the other hand, the humble dwellings of the modern inhabitants, and the rich vegetation of their neighbouring fields, present to his eye an ample store of all that is requisite for the sustenance of man. Dates, barley, Indian corn, pumpions, cucumbers, fig-trees, pomegranates, and apricots, and for meaner purposes, the white thorn and Spanish bean, are described as but a part of the numerous vegetables that reward the industry of the people. The animals in which they most abound are the common fowl, and the brown long-haired and broad-tailed sheep. At the distance of two days' journey from Sebbah is "God-doua," a town of similar produce; and in two days more the traveller arrives at Mourzouk.

SEBEDA, in *Ancient Geography*, a port of Lycia, according to the Periplus of Arrian.

SEBEL, an Arabian name for the disorder of the eye usually called a pannus.

SEBEN, in *Geography*, a town of the bishopric of Brixen, on the site of an ancient town named "Sabiona," destroyed by Attila; eight miles S.W. of Brixen.

SEBENDUNUM, in *Ancient Geography*, a town of Spain, in the Tarragonensis, the country of the Castellani. Ptolemy.

SEBENICO, in *Geography*, a sea-port town of Dalmatia, situated on the Kerka, near the Adriatic; one of the strongest towns on the coast, with a large harbour, defended by four citadels; erected into a bishopric in 1298. It is said to have been founded by a number of banditti, who lived on the rock which is the present site of the castle, and who plundered any vessels that approached the coast. In process of time they built some colleges, and inclosed them with a kind of palisades called "fibue," whence was formed Sebenico. The city was enlarged by an increase of robbers; and afterwards, when the ancient city of Scardona was destroyed, its inhabitants resorted to Sebenico. The inhabitants, oppressed by the king of Hungary, who was then sovereign of Dalmatia, surrendered themselves in 1412 to the republic of Venice. This city, whatever may have been its origin, is the most pleasantly situated of any in Dalmatia, and also the best built, containing the greatest number of noble families, next to Zara. On one side it is defended by a castle on a hill; and towards the sea, upon a narrow channel at the mouth of the harbour by another fort, a noble work of Sammiceli, whose gate resembles that of Verona, by the same celebrated architect. Among the buildings of Sebenico, the dome or cathedral deserves particular notice, on account of its general fabric, and more especially of its roof, which is composed of large pieces of marble, connected together. In the sixteenth century the arts and sciences flourished here more than in any other city of Dalmatia. It has several buildings in good style of architecture, and it has produced many eminent men; 25 miles N.W. of Spalatro. N. lat. 44° 30'. E. long. 16° 15'.

SEBENNYTES NOMUS, in *Ancient Geography*, a nome of Egypt, between the branches of the Nile, called the Pharnuthiac and Athribitic, and near their mouth. Ptolemy divides this nome into the Upper and Lower.

SEBENNYTICUM OSTIUM, the name of one of the seven mouths of the Nile, E. of that called the *Bolbitic*. Ptolemy.

SEBENNYTUS, a town of Egypt, in the Delta, and capital of the Sebennyitic nome.

SEBENSTAIN, in *Geography*, a town of Austria, 10 miles S. of Ebenfurth.

SEBER, WOLFFANG, in *Biography*, a German philosopher and divine, was born at Sula, in the district of Henneburgh, in 1573. He lost his father in early life, and had to struggle with all the difficulties incident to poverty. He completed his studies at Leipzig, and became rector of the school of Schleusingen, afterwards superintendent and pastor at Wafungen, and finally inspector of the gymnasium, and assessor of the consistory at the former place. In old age he was afflicted with blindness, and died in January 1634. He bequeathed his library to the gymnasium of the place of which he had been the rector, and left a fund for the yearly maintenance of six students in theology. His "Index omnium in Homero Verborum," has frequently been reprinted. An edition of it was published at Oxford in 1780. He edited several learned works, and was author of various poems, epistles, and orations.

SEBERE, in *Geography*, a river of Naples, which rises about six miles from Mount Vefuvius, and runs into the sea near Naples, supplying the fountains and aqueducts of that city.

SEBESE, or *Pulo Bicie*, a small island in the straits of Sunda. N. lat. 5° 50'. E. long. 105° 27'.

SEBESTEN, SEBESTENA, *Myxa*, in *Pharmacy*, &c. the fruit of a species of cordia, resembling a little plum or prune, which, when ripe, is of a deep red colour, bordering on black; very sweet, and the flesh, or pulp, glutinous or sticky.

The Syrians make a kind of glue, or birdlime, of the sebestens, called *birdlime of Alexandria*. The fruit has been esteemed pectoral, cooling, and emollient; though it is now discarded by the colleges both of London and Edinburgh.

The stone within it is triangular; it brought its name from Arabia, whence Pliny observes it came in his time into Italy.

SEBESTENA, in *Botany*, a slight alteration of its Arabic name *Sebesten*, is retained by Gartner, instead of the Linnæan appellation of the genus, *Cordia*; which latter, preserving the memory of one, if not two, highly meritorious botanists, surely ought not to be set aside. See *Cordia*, sp. 1.

SEBESVAR, in *Geography*, a town of Transylvania; 22 miles W.S.W. of Colofvar.

SEBETUS, or SEBETHIS, in *Ancient Geography*, a river of Italy, in Campania, which watered the town of Neapolis.

SEBIEZ, in *Geography*, a town of Russia, in the government of Polotsk; 40 miles N. of Polotsk. N. lat. 56° 10'. E. long. 28° 14'.

SEBIFERA, in *Botany*, a genus of Loureiro's, named from *sebum*, tallow, because it produces a similar substance, used for making candles.—Loureir. *Cochinch.* 637.—Class and order, *Dioecia Polyadelphia*. Nat. Ord. *Tiliaceæ*, Juss.?

Gen. Ch. Male, *Cal.* Perianth of four roundish, concave, hairy, spreading leaves. *Cor.* none. *Stam.* Filaments about one hundred, capillary, longer than the calyx, distributed into ten sets; anthers ovate, of two cells.

Female on a separate plant. *Cal.* as in the male. *Cor.* none. *Pist.* Germens about ten, superior, stalked, roundish; style scarcely any; stigmas solitary, obtuse, undivided. *Peric.* Berries about ten, globose, of one cell. *Seeds* foliary, globose.

Ess. Ch. Male, Calyx of four leaves. Corolla none. Stamens an hundred, in ten sets.

Female,

Female, Calyx of four leaves. Corolla none. Pistils ten, stalked. Berries as many. Seeds solitary.

1. *S. glutinosa*. *Bây loi nhót* of the inhabitants of Cochin-China. *Gien kām xú* of the Chinese. Native of the woods of China and Cochin-China. A large tree, with spreading branches. Leaves alternate, stalked, ovate-oblong, entire, smooth. Male as well as female flowers lateral, or somewhat terminal; their stalks two or three together. Berries small, smooth, blackish.

The wood is light, pale, easily wrought, used for posts and beams in houses. The branches and leaves exude a glutinous fluid; and being bruised and macerated in water, they make a sort of gum, used for mixing with plaster or stucco, in order to render it more tenacious and durable. A great quantity of thick, white, fatty oil is extracted from the berries, of which the vulgar make candles, resembling those of tallow or wax, but of a disagreeable smell.

We cannot satisfactorily refer this account to any plant described in botanical works; and yet the tree should seem to be well known in its native country.

SEBINIKVAR, in *Geography*, a town of Transilvania; 6 miles S. of Weissenberg.

SEBIZIUS, or SEBISCH, in *Biography*, the name of a family which was distinguished at Strasburg by the celebrity of the physicians whom it produced, and who successively adorned the professorial chair in that city for the space of 134 years, without interruption, in the persons of four individuals only. The first, second, and fourth of these professors were named *Melchior*; the third, *John Albert*; and all, with the exception of the first, succeeded their fathers in the chair. The first Melchior Sebizius, was the son of George Sebizius, a doctor of laws, and counsellor of the duke of Olnitz. Melchior was born in 1539, at Falkenberg, in Silesia, and was at first intended for the profession of the law; but in 1563 he changed his plans, and began the study of medicine. For this purpose, as was the custom of the times, he began his travels to different universities: he was at Montpellier in 1566, and three years afterwards he went to Italy; and subsequently visited France, where he took the degree of doctor at Valence, in Dauphiny, in August 1571. On his return to Germany, he practised his profession first at Hagenau: but having gone to Strasburg in 1574, he determined to settle there. His talents soon raised him to the rank of professor, and he practised with great celebrity until his death, which took place in June 1625, in the eighty-sixth year of his age.

SEBIZIUS, MELCHIOR, the son of the preceding, was born at Strasburg in 1578. He began his education under his father, and is said to have studied in twenty-seven universities, among which he chose that of Basle as the place of his graduation in 1610. So early as the year 1612, his reputation raised him to the professorial chair, which his father resigned, or rather, perhaps, he became his father's colleague at that time. His increasing reputation obtained him the favour of the emperor Ferdinand II., who created him a count palatine in 1630. But no dignities could seduce him from the practice of his profession, or the duties of his chair; and during the space of sixty-two years, while he taught, and was assessor of the faculty at Strasburg, he examined one hundred and sixty-three candidates, and imposed the doctoral cap on fifty-five physicians. Enjoying uninterrupted health until his last illness, never using spectacles, and suffering no infirmity except a very slight deafness, he lived to the age of ninety-five, and died in January 1674. He was the author of numerous works, especially academical dissertations, in which there is more learning than originality or discovery; whence Haller pronounced him "eruditus

vir, parum usus propriis experimentis." Eloy occupies a page in the detail of the titles of his works.

SEBIZIUS, JOHN ALBERT, succeeded the former, his father, in the professorial chair. He was born at Strasburg in 1615, and graduated in 1639, after having studied in the universities of Basle, Montpellier, and Paris. In 1652 he was appointed to the professorship of anatomy. He succeeded his father as physician to the city, and was elected above twenty times dean of the faculty. He died in February 1685, in the seventieth year of his age. He was the author of some academical essays, and of a volume of "Exercitationes pathologicae," relating to the diseases of the head and chest.

SEBIZIUS, MELCHIOR, the son of John Albert, was born in 1664. After studying medicine at Paris, he returned to Strasburg, and took the degree of doctor in 1688; and in 1701 was elected professor of medicine. He held this office, however, but three years, and died in 1704, being at that time rector of the university. See Eloy Dict. Hist. de la Médecine.

SEBNITZ, in *Geography*, a town of Saxony, in the marggraviate of Meissen; 20 miles E.S.E. of Dresden. N. lat. 50° 59'. E. long. 14° 25'.—Also, a river of Saxony, which runs into the Pollenitz; two miles N. of Schandau.

SEBOIM, in *Ancient Geography*, the name of one of the four towns of the Pentapolis, which were consumed by fire from heaven, with Sodom, Gomorrah, and Adama. Eusebius and Jerome speak of a town of this name which subsisted in their time, and which was situated on the western coast of the Dead sea. The town must therefore have been rebuilt.

SEBOLA, in *Geography*, a town of Portugal, in the province of Beira; 21 miles N.N.W. of Castel Branco.

SEBOO, or SUBU, a river of Africa, which passes by the city of Fez, and runs into the Atlantic a little below Marmora.

SEBORZ, a town of Bohemia, in the circle of Boleslau; 3 miles S.E. of Melnik.

SEBOU, a small island near the N.E. coast of Cape Breton.

SEBRAJEPOUR, a town of Bengal; 13 miles W.N.W. of Doesa.—Also, a town of Bengal; 13 miles S.E. of Koonda.

SEBRIAPA, in *Ancient Geography*, a town of the African Sarmatia, on the banks of the river Vardanus. Ptolemy.

SEBRITHITES, a nome of Egypt, from which king Vaphres sent to Solomon 1000 men for building the temple, according to Eusebius.

SEBRUD, in *Geography*, a river of Persia, in the province of Khorasan, which runs into the Thus, 6 miles S.E. of Zawah.

SEBU. See SIBU.

SEBUÆI, a sect among the ancient Samaritans, whom St. Epiphanius accuses of changing the time expressed in the law, for the celebration of the great annual feasts of the Jews.

Serrarius conjectures, that they were thus called from their celebrating the feast of the passover on the seventh month, called by the Hebrews *seba*, seventh. Drusius rather takes them to have been denominated from *Sebaia*, the leader of a sect among the Samaritans. Scaliger derives the name from the Hebrew, *seba*, week, because of their celebrating every second day of the seven weeks between Easter and Whitstide.

SEBUE,

SEBUE, in *Geography*, a town of Abyssinia; 90 miles S. of Mina.

SEBUNTA, in *Ancient Geography*, a town situated in the interior of Arabia Petræa. Ptolemy.

SEBURAI, SEBURÆI, a name which the Jews give to such of their rabbins or doctors, as lived and taught some time after the finishing of the Talmud.

The word is derived from סָבַר, *saber*, I think: whence סְבָרָא, *fabura*, opinion, sentiment: and thence סְבָרַי, *seburai*, or *seburai*, opinionative.

The reason of this appellation, say the rabbins, is, that the Talmud being finished, published and received in all the schools and synagogues, these doctors had nothing to do but to dispute for, and against, the Talmud, and its decisions. Others say, it was because their sentiments were not received as laws or decisions, as those of the Mischnic and Gemaric doctors were; but were held as mere opinions. Others, as the author of Schalscheleth Hakkabala, or *chain of tradition*, tell us, that the persecution the Jews underwent in those times, not allowing them to teach quietly in their academies, they only proposed their opinion in the composition of the Mischna. The first and chief of the Seburai was R. Josi, who began to teach in the year 787 of the era of contracts; which, according to R. David Gautz, falls on the year of the world 4236, and who, according to R. Abraham, was thirty-eight years president of the Jewish academy.

The era of contracts is the same with that of the *Seleucide*, the 787th year of which falls on the year of Christ 476, which, of consequence, is the era of the origin of the Seburai, whose reigns did not hold long: Buxtorf says, not above sixty years; R. Abraham, and others, say not fifty. The last of them was R. Simona. They were succeeded by the Gaons or Geonim.

SEBURG, in *Geography*, a town of France, in the department of the North; 5 miles E. of Valenciennes.

SEBZ. See KESH.

SEBZVAR, a town of Persia, in the province of Khorasan; it was taken, in 1381, by Timur Bec, but upon its revolting and being again reduced, he caused 2000 of the inhabitants to be piled in a heap, with mortar and bricks, and thus buried alive; 180 miles N.W. of Herat. N. lat. 36° 11'. E. long. 56° 12'.

SECA, LA, a town of Spain, in the province of Leon; 24 miles S.W. of Valladolid.

SECACUL, in the *Materia Medica of the Ancients*, a name given by Avicenna, Serapion, and others, to a root which was like ginger, and was brought from the East Indies, and used as a provocative to venery.

The interpreters of their works have rendered this word *iringo*, and hence some have supposed that our eryngium, or eryngo, was the root meant by it: but this does not appear to be the case on a strict enquiry, and there is some reason to believe that the famous root, at this time called *ginseng*, was what they meant.

SECALE, in *Botany*, a name in Pliny, which some etymologists, among whom is De Theis, derive from the Celtic *segal*. This, he says, comes from *sega*, a sickle in the same language, and thence *seges*, the Latin appellation of all grain that is cut with a similar implement. Those who have looked no further for an etymology than the Latin *seco*, to cut or mow, have come to the same conclusion. Rye.—Linn. Gen. 39. Schreb. 53. Willd. Sp. Pl. v. 1. 471. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 1. 178. Juss. 32. Lamarck Illustr. t. 49. Gært. t. 81.—Class and order, *Triandria Digynia*. Nat. Ord. Gramina.

Gen. Ch. *Cal.* Common receptacle toothed, elongated

into a spike. Glume containing two flowers, and consisting of two opposite, distant, erect, oblong, pointed valves, smaller than the corolla. *Florets* sessile. *Cor.* of two valves; the outermost hardest, tumid, pointed, compressed, fringed at the keel, and ending in a long awn; the inner flat, lanceolate. *Nectary* of two lanceolate, sharpest, fringed scales, tumid on one side at the base. *Stam.* Filaments three, capillary, hanging out of the flower; anthers oblong, forked. *Pist.* Germen superior, turbinate; styles two, reflexed; stigmas cylindrical, feathery. *Peric.* none, except the permanent corolla, which finally opens, and lets the seed escape. *Seed* solitary, oblong, somewhat cylindrical, naked, pointed.

Obs. There is sometimes a third floret, scarcely perfect, stalked, between the other two. It is very difficult to distinguish this genus from *Triticum*.

Ess. Ch. Calyx of two valves, solitary, two-flowered, on a toothed elongated receptacle.

1. *S. cereale*. Cultivated Rye. Linn. Sp. Pl. 124. Willd. n. 1. Ait. n. 1. Pursh v. 1. 90. Host Gram. Austr. v. 2. 35. t. 48. (Secale; Matth. Valgr. v. 1. 364. Camer. Epit. 190. Ger. Em. 68.)—Glumes of the calyx bordered with minute parallel teeth.—The native country of this, so generally cultivated, grain, is hardly to be guessed. Mr. Pursh says it frequently occurs, apparently wild, in North America, flowering in June. For its agricultural history, and mode of cultivation, see RYE. The root is fibrous and annual. *Herbage* somewhat glaucous. *Stem* jointed, slightly branched at the bottom, smooth. *Leaves* linear, rough towards the point. *Spike* terminal, solitary, erect, three or four inches long. *Awns* erect, straight, rough, four or five times the length of the glumes.

2. *S. villosum*. Tufted Rye. Linn. Sp. Pl. 124. Willd. n. 2. Sm. Fl. Græc. Sibth. v. 1. 77. t. 97. (Gramen spicatum fecalinum, glumis villosis in aristas longissimas definitibus; Tourn. Inst. 518. G. fecalinum maximum; Park. Theatr. 1144. G. creticum spicatum fecalinum, glumis ciliaribus; Tourn. Cor. 39. Buxb. Cent. 5. 21. t. 41.)—Glumes of the calyx wedge-shaped, abrupt, fringed with tufts of hairs.—Native of the south of Europe, and the Levant. Gathered by Dr. Sibthorp in the fields of Crete and Zante. The root is fibrous and annual. *Stems* numerous, erect, twelve or eighteen inches high, leafy, smooth; their lower joints bent. *Leaves* spreading, flat, hairy on both sides, with tumid smooth sheaths. *Stipula* very short, blunt, crenate. *Spike* about as long as the former, but twice as thick. *Calyx* bordered with remarkable tufts of fine hairs. This should seem to be cultivated in the above-mentioned islands, but we know nothing of its agricultural merits.

3. *S. orientale*. Dwarf Oriental Rye. Linn. Sp. Pl. 124. Willd. n. 3. (Gramen orientale fecalinum, spicâ brevi et latâ; Tourn. Cor. 39.)—Glumes of the calyx ovato-lanceolate, strongly ribbed, taper-pointed, hairy all over.—Native of the Archipelago, in a sandy soil. *Root* annual, with white downy fibres. *Stems* about six inches high, slender, smooth, often zigzag. *Leaves* linear, narrow; the upper one short, with a long, smooth, inflated sheath. *Spike* hardly an inch long, thick and broad, composed of closely imbricated, two-ranked *spikelets*, whose glumes are rigid, deeply furrowed, uniformly hairy, each tapering into a short, straight, rough point or awn, not so long as the glume itself.

4. *S. creticum*. Tall Cretan Rye. Linn. Sp. Pl. 125. Willd. n. 4; excluding the synonym of Tournefort, which belongs to *Hordeum bulbosum*. (See HORDEUM.)—"Glumes of the calyx externally fringed."—Native of Crete. We have never seen a specimen. Desfontaines asserts that this is distinct from *Hordeum bulbosum* of Linnæus, his *strictum*, which

which is *Gramen creticum spicatum fecalinum altissimum*, tuberous radice; Tourn. Cor. 39; and that he himself was possessed of specimens of both. Both were also collected in the Levant by Tournefort. *Desf. Atlant. v. 1. 113.*

SECAMONE, an Egyptian name, apparently corrupted by the modern inhabitants of Egypt from the Greek *σκῆμνον*; for Prosper Alpinus tells us the plant which bears this name, *Periploca Secamone* of Linnæus, is esteemed, by that people, a sort of Scammony, and its yellow burning juice is, when dry, reckoned by them a powerful purge, for expelling thin humours. Yet he adds that he knew nothing of their making use of the plant in medicine. Such being the origin of this name, we are obliged to protest against it, as unclassical.—Brown Transf. of the Wernerian Society, v. 1. 55. Prodr. Nov. Holl. v. 1. 464. Ait. Hot. Kew. v. 2. 75.—Class and order, *Pentandria Digynia*. Nat. Ord. *Contortæ*, Linn. *Apocineæ*, Juss. *Asclepiadeæ*, Brown.

Ess. Ch. Corolla wheel-shaped. Crown of the filaments of five leaves. Filaments combined, with external appendages. Masses of pollen erect, attached in four rows to the unfurrowed summit of the stigma. Follicles with comose seeds.

A genus of upright or twining, nearly smooth shrubs. Leaves opposite. Cymes forked, between the footstalks. Flowers minute.—Mr. Brown declares this genus to be perfectly natural and distinct, though, from the extreme minuteness of the parts, very difficult to determine. It is the connecting link between the true *Asclepiadeæ* and his *Periploceæ*. Five species have been ascertained by the learned author of the genus.

1. *S. ægyptiaca*. Egyptian Secamone. Ait. n. 1. (Secamone; Alpin. Egypt. 133. t. 134. *Periploca Secamone*; Linn. Mant. 216. Willd. Sp. Pl. v. 1. 1249. Thunb. Prodr. 47.)—Stem twining. Leaves elliptic-oblong, smooth. Corolla hairy.—Native of Egypt, and the Cape of Good Hope. A green-house shrub, cultivated by Miller before the year 1752, and flowering in July. A Cape specimen from Thunberg is in the Linnæan herbarium. The stem is woody, twining, with smooth, round, leafy branches. Leaves about an inch and a half long, on shortish stalks, bluntish, entire, coriaceous, smooth, with one rib and many parallel transverse veins; pale, and somewhat glaucous, beneath. Cymes shorter than the leaves, repeatedly forked, many-flowered; their stalks clothed with silky hairs, of a rusty hue in the dried plant. Flowers hardly a line in diameter, white. Corolla smooth at the back, its upper surface covered with short dense hairs.

2. *S. emetica*. Emetic Secamone. (*Periploca emetica*; Retz. Obs. fasc. 2. 14. Willd. Phytog. fasc. 1. 6. t. 5. f. 2. Sp. Pl. v. 1. 1250.)—Stem diffuse. Leaves lanceolate, smooth. Corolla smooth.—Native of the East Indies. The Rev. Dr. Rottler sent it from Madras. The roots are said to be used instead of Ipecacuanha. This is a spreading, scarcely twining, shrub, of a more slender habit than the former, with much narrower leaves. Corymbs axillary, small, not a quarter so long as the leaves, of few flowers, with downy rusty stalks. Our specimen is in too early a state to display the corolla, but Retzius and Willdenow say it is smooth.

3. *S. canescens*. Hoary Secamone.—Stem twining, with downy branches. Leaves ovato-lanceolate; downy beneath. Corolla downy at the back.—Sent from the East Indies, by the late Dr. Roxburgh, in 1789. We presume this is what Mr. Brown mentions as his third species. Our plant has long, twining, round, pale-green branches, finely downy and hoary, in a young state, like all the stalks, the calyx, outside of the corolla, and backs of the leaves; which last are two

or three inches long, rounded at the base, tapering gradually to a bluntish point. Flowers numerous, somewhat umbellate; their common stalks about equal to the footstalks.

4. *S. elliptica*. Elliptical Upright Secamone. Br. Prodr. n. 1.—“Stem erect. Leaves elliptical, pointed, smooth. General and partial flower-stalks downy. Corolla naked.”—Gathered by Mr. Brown, in the tropical part of New Holland.

5. *S. ovata*. Ovate Spreading Secamone. Br. Prodr. n. 2.—“Stem divaricated. Leaves ovate, acute, smooth. General and partial flower-stalks nearly smooth. Corolla naked.”—Found by Mr. Brown, in the same country as the last.

SECANT, in *Geometry*, a line that cuts another, or divides it into two parts. See LINE, &c.

Thus the line AM (*Plate XIII. Geometry, fig. 4.*) is a secant of the circle AED, &c. as it cuts the circle in B. It is demonstrated by geometers: 1. That if several secants, MA, MN, ME, &c. be drawn from the same point M, that passing through the centre, MA, is the greatest; and the rest are all so much the less, as they are more remote from the centre. On the contrary, the portions of them without the circle MD, MO, MB, are so much the greater, as they are farther from the centre. The least is that of MA, which passes through the centre.

2. That if two secants, MA and ME, be drawn from the same point M, the secant MA will be to ME as MD to MB: or $ME \times MD = MA \times MB =$ the square of a tangent to the circle drawn from the point of concurrence M.

SECANT, in *Trigonometry*, denotes a right line drawn from the centre of a circle, which, cutting the circumference, proceeds till it meets with the tangent to the same circle. Thus the line FC (*Plate Trigonometry, fig. 4.*) drawn from the centre C, till it meets the tangent EF, is called a secant; and particularly, the secant of the arc AE, to which EF is tangent.

The secant of the arc AH, which is the complement of the former arc to a quadrant, is called the co-secant, or secant of the complement.

The sine of an arc, AD, being given, to find the secant of it, FC, the rule is, as the co-sine DC is to the whole sine, so is the whole sine, or radius, AC, to the secant CF: or the secant is a third proportional to the co-sine and radius. See SINE.

To find the logarithm of the secant of any arc, the sine of the complement of the arc being given, multiply the logarithm of the whole sine by two, and from the product subtract the logarithm of the sine complement; the remainder is the logarithm of the secant. The reason of which operation is obvious; because $\frac{EC^2}{DC} =$ to CF; and, therefore,

from the nature of logarithms, twice the log. of EC — the log. of DC = the log. of CF.

SECANTS, *Line of*. See SECTOR.

SECAS, in *Geography*, a cluster of small islands in the Pacific ocean, near the coast of Veragua. N. lat. 8° 20'. W. long. 83° 16'.

SECATABBAS, a town of Asiatic Turkey, in the province of Diarbekir; 75 miles S.W. of Mosul.

SECCA, a small island near the coast of Istria. N. lat. 44° 52'. E. long. 14° 5'.

SECCHIE, a small island near the coast of Istria. N. lat. 45° 14'. E. long. 13° 40'.

SECCHIA, a river of Italy, which runs into the Po, 3 miles N. of Quistello, in the duchy of Mantua.

SECEDERS,

SECEDERS, formed from the Latin word *secedo*, to separate or withdraw, in *Ecclesiastical History*, an appellation comprehending those who are dissenters from the established church of Scotland. This kind of secession took place in the year 1727, when John Glas, disapproving every establishment of a national church, maintained that all churches ought to be *congregational*; or, in other words, that no general church should be formed for a nation, but that each religious society in a kingdom or state should be self-constituted, and controuled only by itself. For this and some other opinions he was suspended from his ministerial functions; and, for continued contumacy, deposed from the rank of minister, first by a provincial synod, and afterwards, *viz.* in 1730, by the general assembly of the Scots church. Persisting, however, in the propagation of his sentiments, both by preaching and writing, he formed several congregations, of which the most numerous was that of Dundee. The secession of Mr. Glas and of his immediate disciples was followed by that of several other divines, who, on different grounds, determined upon withdrawing from the establishment. The two brothers, Ralph and Ebenezer Erskine, enlisted, about the year 1730, in this number, and contributed very much to give reputation and influence to their cause. The seceding ministry alleged various infringements in the constitution of the kirk; but as they despaired of redress, they resolved to establish new congregations. They complained of the laws of patronage, and wished for a popular election of ministers; they pleaded that the right of protest against the proceedings of the assembly had been invaded, and that the rulers of the kirk not only acted arbitrarily, but suffered its doctrines to be corrupted. For the freedom of their animadversions on these points, four ministers were suspended from their parochial functions in 1733; and though they were reinstated by the assembly in the following year, the ground of complaint remained, and they refused to rejoin the establishment. From the clergy and laity they gained an accession of strength, more particularly after they had published a second "Testimony of the Reasons of their Secession." Upon a citation to appear before the assembly, the jurisdiction of which they refused to acknowledge, they were debarred, in 1740, from the exercise of all clerical functions in the church, and excluded from all its emoluments. The Seceders are rigid Calvinists, strict and severe in their discipline, and somewhat austere in their manners.

When the secession had formed three presbyteries, a division took place among them, in 1747, in consequence of an oath, which some of them deemed inconsistent with the sentiments avowed in their "Testimony." This was the ordinary oath of a burgess, in support of the *true religion* established by law. We cannot, said one party, called "Antiburghers," conscientiously honour with that appellation the establishment from which we have seceded; while the other members of the synod, denominated "Burghers," contended that the oath might safely be taken, as the religion of the state was still the true faith, though many of its ostensible votaries had departed from its principles, or loosely professed it. The Antiburghers prevailed in the contest, and obtained a vote, that the oath was incompatible with the testimony; and they even excommunicated the members by whom it was vindicated. This dispute long continued to maintain the separation of the Seceders in distinct synods. Of these two classes, the Antiburghers are said to be the most confined in their sentiments, and least disposed to associate with any other body of Christians.

Under this article we may mention another party in Scotland, who quitted the establishment, and assumed the title

of the "Reformed Presbytery." Lamenting the defection of the national rulers, and the majority of the people, from the true principles of the reformation, a party of religious malecontents renounced all connection with the "revolution kirk," and under the guidance of Mac-Millan and Nairn, formed a seceding presbytery. By these ministers, others were selected for the same functions; and the secession has been continued to the present time. Besides the congregations of this complexion in North Britain, there are several in Ireland, and some in North America. The members profess to follow the scripture as their principal guide, and the ordinances of the Westminster assembly in the next place. They disapprove the high authority assumed by the state over the church of Christ, as the result of worldly policy, rather than a claim justified by the genuine spirit of religion. Yet they submit peaceably to the higher powers, and do not indulge in the clamours of sedition, or the murmurs of disaffection. Their public worship is conducted much in the same manner with that of the dissenters in South Britain.

Another considerable sect departed, in the year 1752, from the Scots establishment. A minister named Gillespie, who opposed the reception of a new minister, whose appointment was not agreeable to the majority of the inhabitants of Inverkeithing, was expelled from the church in which he officiated; and he was soon joined by others, who, like himself, wished pastors to be elected by the people; and they formed a congregation in Dunfermline. The "Presbytery of Relief," in allusion to the desired relief from the arbitrary rigour of the laws of patronage, was the denomination assumed by this body of seceders. More liberal than the generality of Presbyterians, they were willing to admit into their communion all those who seemed worthy of being called Christians, however they might differ with regard to particular points. Their congregations multiplied; and about the close of the last century, the association possessed above sixty places of worship. Both classes of the "Seceders" and "Relief" include about 300 ministers, who are strict Presbyterians, though they secede or dissent from the established church of Scotland. Adams's Religious World displayed, vol. iii. Cooke's edition of Mosheim's Ecc. Hist. vol. vi.

SECERRÆ, in *Ancient Geography*, a town of Spain, in the Tarragonensis, upon the route from the Pyrenees to Castulo, between Aquæ Voconia, or Voconia and Prætorium, according to the Itinerary of Antonine.

SECESPITA, among the Romans, a knife with a round ivory handle, adorned with gold and silver, which the flames and priests used at sacrifices.

SECHELLES, in *Geography*, a cluster of rocky isles in the Indian sea, composed of a reddish granite, and generally low. On these are found some marine animals and vegetables, with different species of palm-trees. S. lat. 4° to 5°.

SECHES. See **SECAS**.

SECHI, —, in *Biography*, an excellent performer on the hautbois, in the service of the elector of Bavaria, in 1772, who, if we had never heard Fischer, would have delighted us much more than the spirit of parallel would allow. However, in a duet with Rheiner, a performer of great merit on the bassoon, we were reminded of the two Bezozzis at Turin; for as their instruments, so their genius and abilities seemed made for each other, there being a like correspondence in both.

SECHIEN, in *Geography*, a town of Persia, in the province of Kerman, on the north coast of the Persian gulf; 141 miles S. of Sirgjan.

SECHIUM,

SECHIUM, in *Botany*, a name given by Dr. Patrick Browne to this genus, and most probably derived from *σηκος* or *σηκίζω*, to *fatten*, the fruit being used in Jamaica to fatten hogs. In this case, however, says professor Martyn, it should have been called *Secium*.—Brown. Jam. 355. Schreb. 664. Willd. Sp. Pl. v. 4. 627. Mart. Mill. Dict. v. 4. Juss. 391. Lamarck Dict. v. 7. 50.—Class and order, *Monoecia Monadelphica*. Nat. Ord. *Euphorbia*; Juss.

Gen. Ch. Male, *Cal.* Perianth inferior, of one leaf, tubular, cloven half way down; tube bell-shaped, spreading; segments of the limb lanceolate, flat, pointed, widely spreading. *Cor.* of one petal; tube the size and figure of the calyx, and adhering to it; limb cloven into five, ovate, flat, acute segments, nearly twice as long as the calyx, and much spreading. Nectary consisting of ten cavities in the upper part of the tube of the corolla. *Stam.* Filaments five, formed into an erect cylinder, five-cleft at the top, spreading; anther one on the top of each filament, all the five together forming a continued, undulating, polliniferous line. Female on the same plant. *Cal.* as in the male, but placed on the germen, deciduous. *Cor.* as in the male, but with larger cavities in the nectary. *Pist.* Germen superior, obovate, downy, five-furrowed; style cylindrical, erect, the length of the calyx; stigma very large, peltate, reflexed, five-cleft at the margin. *Peric.* Apple very large, ovate, turbinate, five-furrowed, fleshy, unequally gibbous at the top, furnished with harmless prickles, one-celled above. *Seed* solitary, nearly ovate, flat or compressed, fleshy, obtuse at each end.

Eff. Ch. Male, Calyx five-cleft. Corolla five-cleft. Nectary ten cavities. Filaments five, forming a cylinder.

Female, Calyx and Corolla as in the male. Style five-cleft. Fruit muricated, single-seeded.

1. *S. edule*. Chocho Vine. Willd. n. 1. Swartz. Ind. Occ. 1150. (*Sicyos edulis*; Jacq. Amer. 258. t. 163.)—Native of the West Indies, where it flowers and fruits in September. *Root* annual. *Stem* herbaceous, climbing or procumbent, greatly divaricated, roundish, striated, smooth, thick. *Leaves* alternate, stalked, angularly heart-shaped, eight or ten-lobed, toothed at the margin, rough on the upper side, rugose beneath, often a span long. *Tendrils* opposite to the leaves, horizontal, very long. *Flowers* monoecious, axillary, yellow, scentless.

Jacquiu informs us that the Chocho Vine is used by the inhabitants of Cuba in their soups and puddings; and that it is served up as a vegetable with boiled meats.

SECHURA, in *Geography*, a town of Peru, in the bishopric of Truxillo, and jurisdiction of Piura, situated on the banks of the river Piura, about a league from the Pacific ocean. The town contains about 200 houses, constructed of cane, and a handsome brick church. The inhabitants, who are all Indians, compose nearly 400 families, and are employed chiefly either in fishing or driving of mules. The desert of Sechura is a waste of sand, extending 30 leagues, of difficult and dangerous passage; 180 miles N.N.W. of Truxillo.

SECUM, among the Romans, a term used to signify ever thing the priests cut with the knife *secespita*, as the *libum*, *placenta*, &c.

SECK, RENT. See *RENT Sec.*

SECK, in *Geography*, a town of Germany, in the principality of Nassau-Dillenburg; 4 miles W. of Mengerskirchen.

SECKACH, a river of Germany, which runs into the Jaxt, at Meckmuhl.

SECKAU, a town of Stiria, the see of a bishop, suffragan of Salzburg; 6 miles N.W. of Knitterfeldt.—Also, a town of the duchy of Stiria; 16 miles S. of Gratz.

SECKBACH, a town of Germany, in the county of Hanau-Munzenberg; 7 miles W. of Hanau.

SECKENDORF, *TITUS LOUIS DE*, in *Biography*, a celebrated German writer, was born at a small village near Nuremberg, in the year 1626. His father having attained to high rank in the army, he was left chiefly to the care of his mother, who obtained for him excellent masters; and by the time that he was ten years old, he had acquired a considerable facility in the Latin language. At this period he began the study of the Greek, the French, and Hebrew languages; and after a short time, he added to the list of his studies that of the mathematics. He was at an early period introduced to the court of Ernest, duke of Saxony, where he remained about a year, and then entered himself as a student at the academy of Gotha. After this he was, by the assistance of a friend, enabled to go to Strasburg, which was at that period celebrated for the ability of its professors; and here he made such a rapid progress, that he surpassed in knowledge almost all his contemporaries.

In 1645 he returned to Erfurt, and afterwards went to Gotha, where he met with a very kind reception from duke Ernest. At this period he was said to be completely master of eight languages, *viz.* the Latin, Greek, Hebrew, French, Italian, Spanish, Danish, and Swedish. He had, moreover, acquired a very deep insight into history, geography, theology, philosophy, and several branches of the mathematical sciences. By these means, and by an assiduity rarely surpassed, he became not only a great statesman, but one of the brightest ornaments of the republic of letters. At the end of two years the prince made him a gentleman of his bed-chamber, and he was employed in various important missions. In 1656 duke Ernest gave him the management of a part of his revenues; and in the same year he accepted the place of aulic judge in the tribunal of Jena, which was conferred on him by the duke of Altenburg. In 1663 he was nominated chancellor, a member of the council of state, and director of the consistory, and of the chamber of justice. The labours attached to these offices were more than his strength was equal to, and in the following year he resigned the greater part of them. After this he was appointed by Maurice, duke of Saxe-Weitz, to be his chancellor, and president of the ecclesiastical senate. John George II., elector of Saxony, nominated him, in 1669, to be one of his counsellors; and that he might devote himself with more attention to this new office, he resigned that which he held at Jena; for he was so strictly conscientious, that he was ever cautious of undertaking any thing that he did not believe he should be able to perform.

On the death of duke Ernest, he was held in no less estimation by his son Frederic, who gave him an important office; and in 1680 the duke of Altenburg entrusted him with the management of a large part of his revenues. He now found the infirmities of age pressing upon him, resigned his employments, and in 1682 retired from public life. After a residence of seven years on his country estate, Frederic III., elector of Brandenburg, invited him to be ecclesiastical counsellor; and soon after chancellor of the university of Halle, which he had founded. He accepted the offer, and removed to Halle in November 1692; but he did not long enjoy his new offices, as death in a few months put an end to his labours, having attained to his 66th year. One of the most striking features in the character of Seckendorf was a rational and sincere piety, which was manifest not only in his writings, but in the whole tenor of his life;

and to this must be ascribed his fidelity to his employers, and the uncommon probity which he displayed in the management of public affairs. He possessed great acuteness and discernment, which enabled him to extricate himself from many embarrassments; and by his indefatigable application, he found means to arrange and go through labours, which would have overwhelmed almost any other person. His works are very numerous, but the most important and considerable is his "Commentary on Lutheranism," which was undertaken with the view of confuting Maimbourg. Duke Ernest had solicited him to write the History of the Reformation, or at least that part of it which related to Saxony; which, in 1682, he agreed to undertake. So highly were his talents estimated, that as soon as his intention was known, most of the German princes opened to him their libraries and archives, and furnished him with such documents as might be useful to his project. A part of the work came out in 1688; but it was not till 1692 that the whole of it was given to the public, under the following title, "Commentarius Historicus et Apologeticus de Lutheranism, sive de Reformatione Religionis ductu D. M. Lutheri in magna Germanica, aliisque Regionibus et speciatim in Saxonia recepta et stabilita," &c. 2 vols. fol. This work was received with great applause by the learned of all parties. Bayle, in speaking of it, says, "Whoever is desirous of being thoroughly acquainted with the history of that great man (Luther), needs only to read the extensive work of Seckendorf. It is, of its kind, one of the best books that have appeared for a long time."

Among the other works of Seckendorf, those most deserving of notice are, "The State of the Princes of Germany;" "A Defence of the Relation concerning Antonietta de Bourignon, or a Refutation of that female Fanatic;" "Historical and Apologetic Dissertations on the Doctrine of Luther in regard to Mass, published by Caspar Sagittarius;" "The State of the Christians, in which Christianity is examined in itself, and defended against Atheists." Gen. Biog.

SECKENHEIM, or SOHERNHEIM, in *Geography*, a town of the duchy of Baden; 4 miles E. of Mannheim.

SECKER, THOMAS, in *Biography*, a celebrated archbishop of the church of England, was born in 1693, at Sibthorp, in Nottinghamshire. His father was a Protestant dissenter, who lived upon a small paternal estate, and who was enabled to give his son an excellent education. He was first placed at a school at Chesterfield, whence he was removed to an academy at Attercliffe, near Sheffield, intended for the education of young men designed for the ministry among dissenters: after this, he was sent to a similar institution in the neighbourhood of Tewksbury. When he was about the age of 19, he had attained to a good knowledge of the classics, the Hebrew language, and of those branches of the mathematical sciences which were taught young men as preparatory to their studies in theology. From this time, till he was about 23 years of age, he pursued his theological course with great vigour; when, for some reasons with which we are unacquainted, he determined to abandon his plan and study physic, and after attending lectures two years in London, he went to Paris for farther improvement, and carried his attention to all the branches of medicine, including surgery and midwifery. During this period he kept up a close correspondence with Mr. (afterwards bishop) Butler, who had been a fellow-student at Tewksbury. His friend had already conformed, and persuaded Secker to follow his example, assuring him of the patronage of bishop Talbot. Secker now began to think seriously of those prospects which were held out to him in

the established church. He was already amply provided with theological knowledge, and he had expressed a dissatisfaction with the divisions existing among the dissenters, and with the authority too frequently assumed by the heads of their congregations; he therefore closed with the invitation held out to him. It was thought right by his friends that he should have a degree from Oxford, with this view; and in order to expedite the process, he took the degree of M.D. at Leyden, in the year 1721, on which occasion he did himself great credit by a thesis which he delivered on the occasion, "De Medicinâ Statica." He then entered himself a gentleman-commoner of Exeter college, Oxford, and in a few months obtained the degree of B.A. in that university. He was ordained by Dr. Talbot, at that time bishop of Durham, and preached his first sermon in March, 1723. The prelate now took him into his family as chaplain, in which office he had Dr. Rundle for an associate. In 1724 he was presented to the valuable rectory of Houghton-le-Spring, in Durham; and being in a situation to maintain a family, he married the sister of Mr. Benson, afterwards bishop of Gloucester; and Mrs. Talbot, the widow of the prelate, by whose advice Secker had conformed, came to live with Mr. and Mrs. Secker, from whom she received, to the end of life, the most assiduous attentions, in return for the services he had received from her late husband.

Secker now set himself down seriously to the duties of a country rector; but the place in which he lived did not agree with the health of Mrs. Secker, and he exchanged Houghton for a prebend of Durham, with the rectory of Ryton. He continued to reside in the north till 1732, when, being nominated one of the chaplains of the king, he came to the metropolis, and in the following year he was presented with the rectory of St. James. Upon this occasion he went to Oxford, to take the degree of doctor of laws, not being of sufficient standing for that of divinity, when he preached what was denominated an act sermon, "On the Advantages and Duties of Academical Education," which was regarded as a master-piece of sound reasoning and good composition. It was printed at the desire of the heads of the houses, and passed through several editions; and the reputation derived from it was thought to be the principal means of his advancement to the episcopal bench, which took place in January, 1734—5, when he was consecrated bishop of Bristol, Dr. Benson, his brother-in-law, being at the same time consecrated to the see of Gloucester. In his high office as prelate he exhibited the most striking proofs of a conscientious attention to all parts of his duty. He now delivered, twice a-week, in his parish church, a course of lectures on the church catechism, which were afterwards published, and which were generally regarded as admirably adapted to give a compendious view of the principles of the Christian religion as professed by the church of England, and as established by law.

In 1737, Dr. Secker was translated to the see of Oxford, which he held more than twenty years, and no one could perform with greater assiduity and earnestness the essential duties of his function; his exterior deportment likewise was grave, dignified, and perfectly adapted to the importance of the character which he maintained. In 1748, Mrs. Secker died, leaving no issue, and the bishop did not marry again. In 1750 he exchanged his prebend of Durham and rectory of St. James for the deanery of St. Paul's; and in 1758 he was raised to the archbishopric of Canterbury. His original education among the dissenters did not render him less zealous in the interests of the church to which he had conformed: he even went farther than most of his contemporaries

poraries in endeavouring to extend the authority of the church of England, and advocated the measure of establishing bishops in the American colonies. On this subject he was attacked by Dr. Mayhew of Boston, to whom he replied with much temper. The argument in favour of American bishops turned upon the incompleteness of an episcopal church without them, and the great inconveniences experienced by the clergy of that remote country in the necessary communication with the mother establishment. The archbishop shewed that he was quite sincere in his wishes for the establishment of episcopacy in America, by bequeathing 1000*l.* towards effecting the purpose. The subsequent separation of the colonies from the British government, however, put an end to this project further than concerned Canada.

During the time that archbishop Secker held his high preferment, the Methodists made very rapid strides in the propagation of their principles: some of the bishops had declared against them; but Dr. Secker acted with his usual prudence, and recommended to his clergy moderation and kindness in their behaviour towards those whom he wished to consider as his future friends, but whom others were disposed to treat as enemies.

The archbishop had for many years been a great sufferer from the gout, which latterly brought on severe local pains. These were at last confined to the thigh, and terminated in an extensive caries of the thigh-bone; one of the fatal consequences of which was a sudden fracture of that bone upon the mere raising him up on his couch. Shortly after this he died, Aug. 3, 1768, in the 75th year of his age.

To the many benefactions for useful and charitable purposes which he bestowed in his life-time, he made large additions by his will. Besides his "Lectures on the Church Catechism," he was author of "Eight Charges delivered to the Clergy of the Dioceses of Oxford and Canterbury; with Instructions to Candidates for Orders, and a Latin Speech, intended to have been made at the opening of the Convocation in 1761;" "Fourteen Sermons, preached on several Occasions;" and "Sermons on several Subjects," in four volumes, published after his death by his chaplains, Drs. Porteus and Stinton. The various works of this able prelate have established his character as one of the most useful and rational preachers among the English divines. Their style is simple and without ornament: they have no pretence to oratory and fine writing; but they display more knowledge of the human heart, and the real motives of action, than is usually found in those kinds of compositions. They are truly didactic, and "come home to men's business and bosoms" in a remarkable degree.

He was attached to those political principles which placed the house of Hanover on the throne; and on the breaking out of the rebellion in 1745, he exerted himself most conspicuously in support of government. He enlisted himself under the banners of no state party; but his chief parliamentary connexions were with the duke of Newcastle and lord Hardwicke. Life of Secker, prefixed to his Sermons.

SECKINGEN, in *Geography*, a town of Baden, on the Rhine, the waters of which surround it; 4 miles W. of Laufenburg. N. lat. $47^{\circ} 34'$. E. long. 8° .

SECKVELT, a town of the state of Utrecht; 13 miles W. of Utrecht.

SECLIA, a name by which some authors have called wormwood.

SECLIN, in *Geography*, a town of France, in the department of the North, and chief place of a canton, in the district of Lille; 4 miles S. of Lille. The place contains

2500, and the canton 13,679 inhabitants, on a territory of $102\frac{1}{2}$ kilometres, in 16 communes.

SECO, a town of Africa, in Kaarta; 65 miles E. of Kemmoo.—Also, a river of Peru, which runs into the Pacific ocean, S. lat. $7^{\circ} 6'$.

SECOANI, in *Ancient Geography*, a town of Asia, in Syria, situated in the mountains, E. of the Mediterranean sea, and W. of the river Orontes, in the territory of Apamæa.

SECOMIÆ, in *Natural History*, the name of a genus of fossils, of the class of the *septariæ*; the characters of which are, that they are bodies of a dusky hue, divided by septa, or partitions of a sparry matter, into several more or less regular portions, of a moderately firm texture, not giving fire with steel, but fermenting with acid menstrua, and easily calcining.

The septariæ of this genus are, of all others, the most common, and are what have been known by the little expressive, or mistaken names of the *waxen vein*, or *ludus Helmontii*. We have many species of these bodies common among us. Of the whitish or brownish kinds we have thirteen; of the yellowish, five; and of the ferruginous ones, four.

SECOND, in *Anatomy*. See *SECUNDI generis*.

SECOND, in *Geometry, Astronomy, &c.* the sixtieth part of a prime, or minute; either in the division of circles, or in the measure of time.

A degree, and an hour, are each divided into sixty minutes, marked thus $'$; a minute is subdivided into sixty seconds, marked thus $''$; a second into sixty thirds, marked thus $'''$, &c.

We sometimes say, a *second* minute, a *third* minute, &c. but more usually, simply, *second*, *third*, &c.

A pendulum, three feet three inches and two-tenths of an inch long, vibrates seconds, according to sir Jonas Moor's reduction of Huygens, three feet eight lines and a half of Paris measure to English measure. See *PENDULUM*.

SECOND, in *Music*, denotes one of the musical intervals; being only the distance between any sound, and the next sound, whether higher or lower.

As in the compass of a tone there are reckoned nine sensibly different sounds, which form those little intervals called *commas*, one might in strictness say there are eight kinds of sounds.

There are three kinds of seconds occurring in practice, the lesser, the greater, and the superfluous second; to which, if the enharmonic genus were restored, we might add the diminished second. The lesser second is the semitone major, and is nearly equal to $5\frac{1}{2}$ commas. The greater second is the tone, which being either major or minor, there must also be two great seconds; one nearly equal to $8\frac{1}{2}$ commas, and the other to $9\frac{1}{2}$ commas; but practitioners usually confound these two. The superfluous second is a tone major, and semitone major; the other superfluous second, arising from the tone minor, and semitone minor, is not in use. Lastly, the diminished second is a semitone minor less than the lesser second; that is, equal to the diesis enharmonica. Thus, between E and F, or between A and B, would be a diminished second, as also between G sharp and A. This last has been practised by Mr. Handel, in the oratorio of Sampson, in the second part of the song, "Return, return, O God of Hosts." See *INTERVAL*.

Some authors, as Ozanam, call the semitone minor by the name of *diminished* second; but this is contrary to the analogy in like cases, where diminished is usually applied to intervals a semitone minor less than a true diatonic interval.

Thus the diminished seventh is a semitone minor less than the flat seventh, or seventh minor.

SECOND, *Diminished*. See DIMINISHED *Second*.

SECOND *de l'Oreille*, in *Anatomy*, a name given by Vieussens and others to a muscle of the ear, called by Cowper and others *stapedaceus*, and *stapedis musculus*; and by Albinus *stapedium*. Winslow calls it *le muscle de l'etrier*.

SECOND *Captain*. See CAPTAIN.

SECOND *Cause*. See CAUSE and EFFICIENT.

SECOND *Deliverance*, *Secunda deliberatione*, in *Law*, a judicial writ that lies after nonsuit of the plaintiff in replevin, and a *retorno habendo* of the cattle replevied, adjudged to him that distrained them; commanding the sheriff to replevy the same cattle again, upon security given by the plaintiff in the replevin for the re-delivery of them, if the distress be justified. It is a second writ of replevin, &c. F. N. B. 68.

SECOND *Flank*, *Notion*, *Order of Curves*, *Rate*. See the substantives.

SECOND *Sight*, an odd qualification, which many of the inhabitants of the Western islands of Scotland are said to be possessed of. The thing is attested by many credible authors (among whom is Mr. Martin, author of the natural history of these islands, and a member of the Royal Society); and, notwithstanding the strangeness of it, many have steadfastly believed it.

The second sight is said to be a faculty of seeing things to come, or things done at a great distance, represented to the imagination as if actually visible and present.

Thus, if a man be dying, or about to die, his image, it is pretended, shall appear distinctly in its natural shape, in a shroud, with other funeral apparatus, to a second-sighted person, who, perhaps, never saw his face before; immediately after which, the person so seen certainly dies.

The quality of second-sightedness, they say, is not hereditary; the person who has it cannot exert it at pleasure; nor can he prevent it, or communicate it to another; but it comes on him involuntarily, and exercises itself on him arbitrarily; and often, especially in the younger second seers, to their great trouble and terror.

There is a great number of circumstances said to attend these visions; by observation of which, the particular circumstances, as to time, place, &c. of the death of the person, &c. are learnt. The method of judging of them, or interpreting them, grows into a kind of art; which is very different in different persons. Second-sightedness is held a discredit in the country; so that none, they say, will counterfeit it; but that many conceal and dissemble it. See Johnson's *Journey to the Western Islands of Scotland*, p. 248, &c.

SECOND *Surcharge*, *Writ of*, in *Law*. See SURCHARGE.

SECOND *Terms*, in *Algebra*, those where the unknown quantity has a degree of power less than it has in the term where it is raised to the highest.

The art of throwing these second terms out of an equation; that is, of forming a new equation, where they have no place, is one of the most ingenious and useful inventions in all algebra.

SECOND *Tithe*. See TITHE.

SECONDARY, or SECUNDARY, an officer who acts as second, or next to the chief officer.

Such are the secondaries of the courts of king's bench and common pleas; the secondaries of the compters, who are next the sheriffs of London in each of the two compters; two secondaries of the pipe; secondaries to the remembrancers, &c.

Secondary is more frequently used in an adjective sense, by way of opposition to primary, or principal.

SECONDARY *Adors*. See ACTOR.

SECONDARY *Affections*. See AFFECTION.

SECONDARY *Circles of the Ecliptic*, are circles of longitude of the stars; or circles which, passing through the poles of the ecliptic, are at right angles to the ecliptic. See CIRCLES of *Latitude*.

By the help of these, all points in the heavens are referred to the ecliptic; that is, any star, planet, or other phenomenon, is understood to be in that point of the ecliptic, which is cut by the secondary semicircle, which passes through such star, or phenomenon.

If two stars be thus referred to the same point of the ecliptic, they are said to be in conjunction; if in opposite points, they are said to be in opposition; if they be referred to two points at a quadrant's distance, they are said to be in a quartile aspect; if the points differ a sixth part of the ecliptic, they are said to be in sextile aspect.

In the general, all circles which intersect one of the six greater circles of the sphere at right angles, may be called secondary circles. As the azimuth or vertical circles in respect of the horizon, &c. the meridian in respect of the equator, &c.

SECONDARY *Collateral Points*. See COLLATERAL.

SECONDARY *Conveyances*, in *Law*. See DERIVATIVE.

SECONDARY *Dials*. See DIAL.

SECONDARY *Fever* is that which arises after a crisis, or the discharge of some morbid matter; as after the declension of the small-pox, or measles. See FEVER, *Small-Pox*, &c.

SECONDARY *Motion*. See MOTION.

SECONDARY *Place*. See PLACE.

SECONDARY *Planets*, those moving round other planets as the centres of their motion, and along with them round the sun. See PLANET.

SECONDARY *Qualities*, *Rainbow*. See the substantives.

SECONDARY *Use*, in *Law*. See USE.

SECONDIGNY, in *Geography*, a town of France, in the department of the Two Sevres, and chief place of a canton, in the district of Parthenay; 6 miles W.S.W. of Parthenay. The place contains 1405, and the canton 6140 inhabitants, on a territory of 172½ kilometres, in seven communes.

SECONDINE. See SECUNDINE.

SECORA, in *Geography*, one of the branches of the river Darah, which joins the main stream at Timeskit.

SECOTAN, a town of Candahar; 150 miles S.E. of Candahar.

SECOURSSE, DENYS-FRANÇOIS, in *Biography*, was born at Paris in 1691. He was one of the earliest pupils of the celebrated Rollin, and being brought up to the bar, he was for some time a pleader. This profession, however, he quitted in order that he might devote himself entirely to literature, in which the study of French history was his principal object. In 1723 he was admitted into the Academy of Inscriptions and Belles Lettres. The office of censor-royal was conferred upon him, and he was appointed, in 1746, to examine the public documents preserved in the newly conquered towns of the Low Countries. He died at Paris in 1754. His publications were, the *Collection of Royal Ordonnances*, from the second to the ninth volume inclusive; "*Mémoires pour servir à l'Histoire de Charles le Mauvais*," two vols. 4to.; an edition of the "*Mémoires de Condé*," six vols. 4to., in conjunction with the abbé Lenglet; and several dissertations in the "*Mémoires de l'Acad. des Inscriptions*."

SECOZANO, in *Geography*, a town of the county of Tyrol; 13 miles N.N.E. of Trent.

SECRÉTARIUM, among the Romans, a reclusive room, where

where the judges considered the causes that had been litigated before them, and came to a resolution what sentence they were to pass from the tribunal. It was most usually separated from the tribunal by a veil.

SECRETARY, an officer, who, by order of his master, writes letters, dispatches, and other instruments, which he renders authentic by his signature.

Of these there are several kinds, as secretary of state, secretary of war, secretary of the treasury, secretary of the admiralty, secretary of the lord chancellor, &c.

SECRETARIES of State, are officers attending the king, for the receipt and dispatch of letters, grants, petitions, and many of the most important affairs of the kingdom, both foreign and domestic.

The king's secretaries were anciently called the *king's clerks* and *notaries*, *regi a commentariis*. As for the name secretary, it was at first applied to such as, being always near the king's person, received his commands, and were called *clerks of the secret*; whence was afterwards formed the word *secretary*, *regi a secretis*; and as the great lords began to give their clerks also the quality of secretary, those who attended the king were called, by way of distinction, *secretaries of the commands*, *regi a mandatis*. This continued till the reign of our Henry VIII. 1559; when, at a treaty of peace between the French and Spaniards, the former observed, that the Spanish ministers, who treated for Philip II. called themselves *secretaries of state*; upon which, the French *secrétaires de commandements*, out of emulation, assumed the same title; which thence passed also into England.

Till the reign of king Henry VIII. there was only one secretary of state; but then, business increasing, that prince appointed a second secretary; both were of equal power and authority, and both styled *principal secretaries of state*. Before queen Elizabeth's time, the secretaries did not sit at the council board; but that prince admitted them to the place of privy counsellors, which honour they have held ever since; and a council is never, or at least very seldom, held without one of them. On the union of England and Scotland, queen Anne added a third secretary, on account of the great increase of business, which, as to Britain, was equally and distinctly managed by all the three, although the last was frequently styled *secretary of state for North Britain*. We have had also a secretary of state for the American department. But both these offices are now abolished, and there still remain three principal secretaries, *viz.* one of the home department, another of foreign affairs, and the third of the colony and war department, who have under their management and direction the most considerable affairs of the nation, and are obliged to a constant attendance on the king; they receive and dispatch whatever comes to their hands, be it for the crown, the church, the army, private grants, pardons, dispensations, &c. as likewise petitions to the sovereign; which, when read, are returned to the secretaries for answer; all which they dispatch according to the king's command and direction.

Ireland is under the direction of the chief secretary to the lord-lieutenant, who has under him a resident under secretary.

Each of the three *principal secretaries* has two *under secretaries* and one or more chief clerks, besides a number of other clerks and officers, wholly depending upon them.

Our secretaries of state are allowed power to commit persons for treason, and other offences against the state, in order to bring them to their trial. Some have said that this power is incident to their office; and others, that they derive it in virtue of their being named in the commissions of the peace for every county in England and Wales.

The secretaries of state have the custody of that seal, properly called the *signet*, and the direction of the signet office; in which there are four chief clerks and three deputies employed, who prepare such things as are to pass the signet, in order to the privy or great seal. All grants, signed by the king, are returned hither, which, transcribed, are carried to one of the principal secretaries of state, and sealed, and then called signets; which, being directed to the lord privy-seal, are his warrant.

On the secretaries of state is likewise dependent another office, called the *paper-office*; in which all public writings, papers, matters of state, &c. are preserved.

All the under secretaries and clerks are in the choice of the secretary of state, without reserve to any person; the under secretaries receive orders and directions from them, for writing dispatches, foreign or domestic, which they give to the chief clerk, who distributes them to the under clerks.

The *secretary at war* belongs to the war-office, and has under him a deputy secretary, with his private secretary, and a number of clerks and other officers.

SECRETARY of an Embassy, is a person attending an ambassador, for the writing of dispatches relating to the negotiation.

There is a great difference between the secretary of the embassy, and the ambassador's secretary; the last is a domestic, or menial of the ambassador's; the first a servant, or minister of the prince.

SECRETION, in *Physiology*, is that vital process, in which some substance, either designed to answer a purpose in the animal economy, or to be thrown out of the body as useless or injurious, is separated from the blood by an organ of glandular structure. It agrees with *nutrition*, with the *exhalations* from the skin, membranes, adipous and lymphatic cells, in being the separation of something from the blood, but it is distinguished from these processes by the circumstance of its being performed by glands. The word *secretion* however is often used more loosely by medical writers, in application to any living process, by which matters are separated from the blood. The organic structures, in which secretions are carried on, the material agents of these processes, and the powers by which they are executed, are considered under the article **GLAND**.

SECT, **SECTA**, a collective term, comprehending all such as follow the doctrines, or opinions, of some famous divine, philosopher, &c. For the scriptural meaning of the term sect, see **HERESY**.

The sects of philosophers among the ancients, particularly in Greece, were numerous: as the Pyrrhonians, Platonists, Epicureans, Stoics, Peripatetics, Academics, &c. See each under its proper article.

In later times, the sects of philosophy have been chiefly reducible to three; *viz.* the Cartesians, Peripatetics, and Newtonians. See **CARTESIAN**, &c.

In theology, the sects are much more numerous; yet the ancients had many legions, now extinct; as Machinees, Gnostics, Montanists, &c.

The principal now on foot are the Lutherans, Calvinists, Anabaptists, Arians, Socinians, Arminians, and Unitarians. The rise, progress, and fate, with the distinguishing characters and opinions of each, see under **LUTHERAN**, **CALVINIST**, &c.

SECT, *Ionic*. See **IONIC**.

SECT, *Italic*. See **ITALIC**.

SECTS of Hindoos. It has been long known that the Hindoos are divided and subdivided into a number of sects, tribes, or casts. Under our articles **BRACHMANS**, **CAST**, and **GENTOOS**, we have given the substance of what has been communicated

SECTS OF HINDOOS.

communicated by early and later travellers to eastern regions on the subject of these distinctions. In common with these writers, we have also used the term *cast*, or *caste*, though we are not aware of any classical authority for the word. We are disposed to think it introduced by the Portuguese; and it is now, and has been for many years, as common in the mouths of natives as of Europeans, especially on the coast of Coromandel. We do not affirm that the word is not of Sanscrit origin, and in truth it sounds very like it: but we have never met with the word in eastern writings, nor heard it used by natives beyond the reach of European colloquial influence.

In considering the division and subdivision of the numerous race of Hindoos, we are disposed to separate them into *theological, civil, and philosophical* classes or tribes. *Theologically* we find two grand divisions, the Saivas, who worship Siva, and the Vaishnavas, who worship Vishnu: these are numerously subdivided, as we shall notice presently, as are the many schismatics who essentially or trivially dissent from both, and are probably numerically equal to both, under the generic denomination of Budhas or Baudhists, and its various specific varieties. The *civil* grand divisions are four, *viz. Brahman, Kshetriya, Vaishya, and Sudra*. As the two former theological grand divisions comprise the whole race of Hindoos (leaving for the present the schismatics out of the question), so do likewise these four civil tribes or grand divisions: either of the four may be theologically a Saiva or a Vaishnava, as his parents may have taught, or his feelings led him. These four civil grand divisions are subdivided into almost innumerable distinctions and varieties. Here follows a brief outline of the distinctions of these four great civil tribes. 1. *Brahman*. This is a small tribe in point of number; but in power paramount. Intellect is power; and, with a few exceptions, the intellectual wealth of India is confined to the Brahmanical treasury. As among the Jews all priests were taken from the tribe of Levi, so with the Hindoos the tribe of Brahman exclusively furnishes the priesthood. All Hindoo priests are therefore Brahmans, but all Brahmans are not priests. Ministers and public officers of state are very commonly Brahmans, even in Mahomedan governments; and they are occasionally merchants, and even foldiers. In both the British and native armies of India, are many Brahmans. The two Mahratta generals whose names are best known in England, Purferam Bhon and Hurry Punt, were both Brahmans. A Brahman is pointedly prohibited from becoming a king: royalty appertains to the second tribe. (See PESHWA.) In the Gita, a work profoundly venerated by numerous sects, the duties of the four tribes are very concisely and plainly stated. "The natural duty of the Brahman is peace, self-restraint, zeal, purity, patience, rectitude, wisdom, learning, and theology." Gita, p. 130. (See MAHABARAT.) The word Brahman means a theologist or divine: derived from Brahm, the divinity. Pandit, corruptly Punt, means a learned Brahman, or philosopher; hence *panditiya*, philosophy. Among the Mahrattas, where Brahmans are very numerous, the title of Punt is assumed by many individuals: seldom, if ever, by those in low stations. In very low or base occupations Brahmans are, indeed, never seen. The names of individuals often indicate their sect. Purferam Bhon, above-mentioned, we should infer to have been of the grand division Vaishnava, and of the sect of Ramanuj. (See PARASU RAMA, which is the classical mode of writing and pronouncing his name, and RAMANUJ.) Hurry Punt, is from his name known to have been a Brahman (Pandit) of the grand division Saiva: Hari (corruptly Hurry) being a name of Siva. See SIVA.

2. *Kshetriya*, usually pronounced Ketri, or Kshetri, is the second civil grand division. It is the warrior tribe; comprising all foldiers, who alone can lawfully become kings. (See PESHWA.) All the other tribes, however, furnish foldiers; and, indeed, princes too, if the ambitious individual can effect it. "The natural duties of the Kshetri are bravery, glory, fortitude, rectitude, not to flee from the field, generosity, and princely conduct." (Gita, ib.) This grand division is very numerous. Some hundreds of different sects might be enumerated as belonging to it, and many hundreds would still be omitted. The Ayn Akbery states, (vol. iii. p. 87. Calcutta ed.) that of the tribe of Kshetri, there are upwards of five hundred subdivisions, fifty-two of whom are in esteem, and twelve particularly so. Of one of these subdivisions, that of Rajput, the same authority says there are upwards of a thousand different sects. The term Rajput, or rather Rajaputra, means offspring of kings; a title assumed by various warrior tribes in the north of India; individuals of which are pretty numerously spread in the southern and other provinces, wherever good pay invites their services.

3. *Vaishya*, vulgarly called Vais, or Bhyse, is the tribe next in rank to the military. This is a very numerous tribe, comprising merchants, traders, and cultivators. In this, that is, practising its avocations, are found many individuals of the three others. "The natural duty of the Vaishya is," according to the Gita, "to cultivate the land, tend the cattle, and buy and sell." (Ibid.) This tribe is numerously subdivided like the others. It contains a great proportion of wealthy individuals. The subdivision of Vania, or Bania, called by the English Banyan, belongs to this class, and is said to comprehend eighty-four different sects: it being only itself a tribe of this third grand division, or of Vaishya.

It is understood, that all the individuals of the three first tribes or sects above named, are susceptible of regeneration, by a mysterious initiation in the *gayatri*, and the investiture of a holy thread called *zennaar*. Such individuals are called *twice-born*. See our articles O'M and ZENNAAR for farther notice of these particulars.

4. *Sudra*. In this is comprised mechanics, artisans, and labourers of every description. In the prosecution of the Sudras' avocations, individuals of the second and third tribes or classes will be found; and occasionally, though comparatively but rarely, of the first. Many mechanics and artisans are of the third class. "The natural duty of the Sudra is servitude." Gita.

This arrangement into casts or sects, tribes or grand divisions, is, as before noticed, of very early origin. In the Institutes of Menu, (see MENU,) we find it laid down as of the remotest antiquity; and, as is usual with every thing relating to the Hindoos, traced to a mythological source. "That the human race might be multiplied, he (the supreme lord, or Brahma) caused the Brahman, the Kshetriya, the Vaishya, and the Sudra, (so named from the scripture, protection, wealth, and labour,) to proceed from his mouth, his arm, his thigh, and his foot." Ch. i. v. 31.

In early times it is probable that these distinctions or separations were kept up and observed with considerable strictness, both in respect to intermarriages and avocations. Those times were, however, anterior to the Institutes of Menu, who gives names to the spurious offspring of sectarian intermarriage; wisely endeavouring to correct, what his authority would prove unequal to prevent, or materially restrain. Denunciations, however, against these illicit practices, sexual and handicraft, abound in the books of law; and absolution from the sin thus incurred is doubtless one, and

SECTS OF HINDOOS.

and no trifling, source of the revenue and power of the priesthood.

We shall notice a few of the chief religious sects into which the race of Hindoos comprised in the above four grand civil classes are subdivided. To enumerate them all would be scarcely possible, even with the assistance of learned natives; and to place them in their relative rank, altogether impracticable: for it is a point involving great differences of opinion; as may be imagined when the religious feelings and pride of many individuals clash, and where great scope is afforded for their display in a field bounded by no precise authority.

Five principal sects are recognized who worship exclusively a single deity. These are 1. The *Saivas*, who worship Siva. 2. The *Vaishnavas*, who worship Vishnu. 3. The *Sauras* or *Suras*, who worship Surya, or the sun. 4. The *Ganapatyas*, who worship Ganefah. 5. The *Saktas*, who worship Parvati. But if we examine closely the relation which they respectively bear to each other, we shall find the fourth and fifth to be ramifications of the first, or sect of Saiva; of which may be traced these distinctions. 1. *Saiva* itself, generally supposed to include both the worshippers of Siva singly, or of him and Parvati conjointly. (See SAIVA.) 2. *Lingi*, the adorers of Siva under his phallic emblem called Linga. (See LINGA and LINGI.) 3. *Sakta*, the adorers of Parvati, under her symbol the Yoni. (See SAKTA and YONI.) 4. The *Ganapatyas*, worshippers of Ganefah, son of Parvati and Siva. (See POLLEAR.) These four sects, and many distinctions and divisions of them, may be deemed as comprehended in the first named, Saiva, or Saivabakt. The worshippers of Baghefa, or Siva, are sometimes called Soma Siddhanta.

The second great sect of Vaishnava is also variously divided and subdivided. Two principal divisions or branches are the *Gokalashta* and *Ramanuj*, or worshippers of Vishnu, in two of his grand incarnations of Krishna (one of whose names is Gokal), and of Rama. These two principal sects of Vaishnava are each divisible into three. The *Gokalashtas* are 1. Those who exclusively worship Krishna as Vishnu himself; and this sect is extensively considered as the true and orthodox Vaishnava. (See KRISHNA and VAISHNAVA.) 2. Those who exclusively worship Radha, as the *fakti* of Krishna. (See RADHA, SAKTA, and SAKTI.) This sect is sometimes called *Radha-ballabhi*. 3. The worshippers of Krishna and Radha conjointly. The three distinctions of *Ramanuj* are, 1. Those who worship Rama only. (See RAMA and RAMANUJ.) 2. Those who worship Sita only. And 3. Those who worship both Rama and Sita conjointly. See SITA.

The sect of Ganapatyas we have considered as a division of that of Saiva; and the sect of Saura, worshippers of Surya, or the sun, we are disposed to class under that of Vaishnava; for although Siva be the sun as well as Vishnu, yet the latter, and more particularly in his incarnation of Krishna, is more generally reckoned the archetype of the solar deity; or, what amounts to the same thing, the sun, a symbol or type of Vishnu. Individuals of several sects of Saivas do no doubt mix their adorations with the solar worship; as do also many sects of the Vaishnavas. See SAURA.

Under our article SAKTI we have observed that the Hindoo mythology has personified the abstract and attractive powers of the divinity, and ascribed sexes to these mythological personages. The Sakti, or energy of an attribute of God, is female, and is fabled as the consort of that personified attribute. Hence has arisen such a series of fictions, comprehending all natural and moral phenomena, obscured

by mythological and sexual allegories, as it is scarcely possible to explain. (See LAKSHMI, PARVATI, and SARASWATI.) Respecting the *Saktas*, that is, those who worship exclusively or chiefly the Sakti or female power, this distinction has been noticed; some of them, adopting what is called a left-handed path, accompany their devotions by divers obscene and indecent acts: others do not. The sect of *Radha-ballabhi*, who are supposed to worship the female energy in Lakshmi, under her form of Radha, are accused of these indecencies. (See RADHA.) Among the *Saktas* of the Saiva tribes there is also a left-handed or indecent, as well as a right-handed or decent mode of worship; and those who adopt the former are said to go the length of extreme profligacy. (See SAKTA.) We should be disposed to class all the individuals who thus, either in the right or left-handed path, adore the female power, under the denomination of *Yonijas*, or worshippers of the Yoni; the symbol more especially of Parvati: but for this, though a reasonable classification, we cannot quote any immediate authority. (See YONI.) None of the sect of Ramanuj are accused of the left-handed enormities. In most parts of India they are, when known, held in deserved detestation; and the decent *Saktas* forbear making any ostentatious profession of their tenets, or wearing on their foreheads the mark of their sect, lest they should be suspected of belonging to the other branch of it.

There is another very numerous sect of Vaishnavas, called *Bhagavatas*, of more modern origin than the others. Their tenets and practices are grounded on the eighteenth Purana, which is chiefly a history of the life, adventures, and doctrines of Krishna, and is entitled *Sri Bhagavata*, which see. The work is ascribed to Vapadeva, who endeavoured to reconcile and unite all sects, by recognizing the deities of each, but as subordinate to the Supreme Being, or as attributes or manifestations of God. This is, in fact, the doctrine of the Gita; but that work, as well as the *Sri Bhagavata*, while professing to uphold a unity in the deity, claims that pre-eminency for Krishna; and although the sect of *Bhagavata* is very numerous, and includes individuals of or from many other sects, still a purity of doctrine is far distant from all, while a mythological personage continues clothed in the attributes of the Almighty. For all the other sects, or at least a portion of the most enlightened and liberal individuals among them, are sufficiently ready to profess a belief in the unity of the deity, if their claim of that awful designation for the object of their own adoration be conceded. See KRISHNA, SARASWATI, and SIVA.

The *Bhagavatas*, while recognizing the five divinities worshipped by the other sects respectively, and even paying them in turn their daily adoration, and on particular occasions extending it to other deities, still deny the charge of polytheism, and repel the imputation of idolatry. It may be easily imagined that but few, we may almost say none, of the numerous followers of this sect can fully comprehend the doctrines they profess. They incline much to real polytheism, but do at least reject the derogatory notions of the deity which the other sects seem to have adopted. The practice of adoring images of celestial spirits, they justify by arguments similar to those which have been elsewhere employed in defence of image worship. (See GENTOOS and IDOLATRY.) If the doctrines of the Veda, and even those of the Puranas, be closely examined, the Hindoo theology will be found consistent monotheism, though it contains the seeds of polytheism and idolatry. See PURANA and VEDA.

Modern Hindoos seem to have misunderstood the numerous texts in their sacred books, which declare the unity of the godhead,

SECTS OF HINDOOS.

godhead, and the identity of Vishnu, Siva, the Sun, &c. Their theologists have entered into vain disputes on the question of which, among the attributes of God, shall be deemed characteristic and pre-eminent?

Sankaracharya (see the article under his name) the celebrated commentator on the Veda, contended for the attributes of Siva, and founded or confirmed the sect of Saiva, who worship Siva as the supreme being, and deny the co-equal or independent existence of Vishnu and other deities. Madhava and Vallabha, both also surnamed *Acharya*, denoting literary dignity, have in like manner established by their comments the sect of Vaishnava, who adore Vishnu as God.

Under the article *SARASWATI* we have noticed, that there is now no sect, who exclusively or principally worship Brahma: no one hath hitherto been discovered named after him, denoting the creative power to be the object of exclusive adoration. Still by some legends he is described as the Almighty; leading us to infer, that he was once secularially addressed as the other two members of the triad now are. His *sakti*, *Saraswati*, is described in some passages as all-productive, all-powerful, and all-wife. It may be reasonably inferred, that there are many more sects among the Hindoos than have hitherto been ascertained. Most of the sects, however, approach or melt into each other on close inspection; as may in all such cases be supposed, when they must all have originated in one common source. This reunion is with the Hindoos marked with their usual extravagant sexual mythology. Siva and Parvati, they say, had a contest on the question of the comparative potency or eminence of their several worship: in other words, the worshippers of their symbols, the Linga and Yoni, contested the point. To appease this physiological difference between the god and his consort, Vishnu interposed, and his navel, or rather *os tinca*, came at length to be considered as the same with the Yoni; confounding the Vaishnavas with the Yonijas: but we must refer to our article *YONI*, and the other articles and the works therein mentioned, for farther particulars on this point.

In the early part of this article, we have adverted to the numerous schismatics, under the generic term of Baudhas, followers of the doctrines of Budha or Boodh. (See *BOODH*.) These, under various designations, we are disposed to class as heretical Vaishnavas, worshipping Vishnu under one of his avatars or incarnations, that of Budha; as the Gokalaithas and Ramanujas do under others; those of Gokal, or Krishna and Rama. "In respect to the numbers of followers," the author of the Hindoo Pantheon observes, "and the extent over which they have spread, the doctrines of Budha have probably obtained greater dominion than those of any other religious persuasion. Although now comparatively trifling on the continent of Hither India, his doctrines and followers are still found, differing in externals, and divided into sects, throughout China and its tributary nations; in the great empires and states of Cochin-China, Cambodia, Siam, Pegu, Ava, Asam, Tibet, Budtan or Bootan, (see those several articles,) many of the Tartar tribes, and generally all parts east of the Ganges; including those vast and numerous islands in the seas eastward and southward of the farther Indian promontory, whose inhabitants have not been converted to Islamism. In these great and distant parts of the globe the tenets of Budha, distinguished by various appellations, may be recognized as forming the religion of the people; an extent exceeding that either of the Mahomedan or Brahmanical superstition, and outnumbering, perhaps, the followers of the religion of Jesus Christ." P. 240.

Budhism, like other distinctions of faith among Hindoos, is divided into sects. If it be reckoned the grand generic schism, we may deem the sects of Jaina and Mahiman specific varieties; and there appears no good reason why they should not all be classed with the other sects, who adore exclusively one of the avatars or incarnations of Vishnu, under the comprehensive denomination of Vaishnavas. Of these avatars see under the article *VISHNU*; and for some account of the heresy of Budha and its subdivisions, see *BOODH*, *JAINA*, *SAKYA*, and the other articles thence referred to.

Most oriental people seem to have prided themselves on distinguishing their deities by a great many names. These names are, however, mostly, perhaps all, significant and characteristic; of which early enquirers were of course ignorant. The prevalence of this pride will be seen in our articles *PARVATI*, *SIVA*, and others. In the instance of Budha, another proof might be exhibited of the same feeling. He is distinguished by different names in the same and in distant parts. Boodh, Budha, Butta, and others of nearly similar sound, are mere varieties, in different parts of India, in orthography and pronunciation; and so perhaps is the Bud, or Wud, of the ancient Pagan Arabs. Pout in Siam; Pott, or Poti, in Tibet; and But in Cochin-China, are the same; the Chinese having, it is said, no B or D in their alphabet, and their language being monosyllabic, softened his name into Fo, or Fo-e. (See *FO*.) They call him also *Xa-ka*; a variation, perhaps, of the Sanscrit *Sakya*. (See *SAKYA*.) That the Toth of the Egyptians, and the Woden of the Scandinavians, and other northern nations, is the same name and deity, is upheld by some; but the supposition is derided by others: some, indeed, will not recognize him in the Fo of China. A Buddha, whether the ninth incarnation of Vishnu or not may be disputed, has been deemed to answer in character with Mercury; so has the Gothic Woden. Each respectively gives his name to the same planet, and to the same day of the week. Budhvar is, very extensively in India, whether among Baudhas, Saivas, Vaishnavas, or Mahomedans, the same with Dies Mercurii, or Woden's day; whence some have derived our Wednesday.

The common reproach of the Brahmans is that the Baudhas uphold the dangerous dogma of the eternity of matter and the perishability of the soul. But we ought to receive accounts of the tenets of a hostile sect with caution; and of the Baudhas and Jainas we have yet but little else. Like the Jainas, their worship is confined to deified saints; and the name for the chief of them is, as stated in another place, derived from the Sanscrit word *budh*, to know; hence Budha is philosophy: and hence has been derived the Saxon and English verbs *bodian*, to bode, forebode, &c.

The Jaina, or votaries of Jaina, are probably the most ancient of Hindoo sectaries. They reject, like the Baudhas in general, the authority of the Vedas; and are the most scrupulous of any sect in their cautions against the even accidental extinction of animal life. (See of this under our article *JAINA*.) In the Vedas the slaughter of animals is not only allowed, but on some occasions enjoined. (See *VEDA*.) The adoration of the Jainas is exclusively offered to deified mortals, or rather, as they affirm, through them to the deity: and in the class of deified mortals may be included many of the gods of the Hindoos, although they profess to reject the polytheism and incarnations of the latter. The doctrine of transmigration is found among the Jainas; how extensively is not ascertained: the belief of a future state of rewards and punishment, and an extensive portion

SECTS OF HINDOOS.

portion of the Puranic history, is common to them with the orthodox Hindoos. Formerly powerful and widely diffeminated, this sect is supposed to have suffered great diminution from the extension of the modern heresy of Buddha. And at present its more opulent members are said to find it convenient to resume the orthodox persuasion, which may be done without much difficulty, and must greatly tend to a diminution of its members and respectability.

Several of the sects noticed in the articles of this work named after them, are described as distinguished by marks on their foreheads, arms, and breasts. The forehead mark is the chief distinction, and when horizontal or parallel with the eye-brows, it is understood to designate a Saiva, while a Vaishnava is recognized by its perpendicularity. One, two, or three of these lines, red, white, or yellow, accompanied by circlets and dots, differing in position and colour, together with many other symbols and hieroglyphics, afford an infinite variety of indications of the sectarial bias of the individual so decorated. When convenient, and no especial objection exists, it is said to be held necessary, that these marks be daily renewed; and, of course, by the hand of a Brahman. One of that tribe cannot perform his daily sacrifices, ablutions, &c. without the completion or contemplation of this distinction; and it is held irreverent in one of an inferior tribe to approach a holy man, or to ask his blessing, without, or in view to, this sectarial decoration. The second plate of the Hindoo Pantheon contains some scores of these mysterious symbols. To that work, page 400, &c. we refer such of our readers as desire farther information on this point, for a curious variety of the distinguishing marks, and a full explanation of their sectarial application.

Another sect, who worship fire, or its personification in Agni its regent, is noticed under the article SAGNIKA, (which see). This is referrible to the grand division SAIVA, Agni being of that line of parentage. See PAVAKA.

Having, under the article PHILOSOPHY of the Hindoos, given the names of the principal sects, or schools; and referred for a brief explanation of the several doctrines to the articles of this work, under which they are respectively noticed, we shall not, in this place, offer any thing farther thereon. For some of the particulars of this article we are indebted to Mr. Colebrooke's Essay on the Religious Ceremonies of the Hindoos, in the ninth volume of the Asiatic Researches, and to the Hindoo Pantheon.

From what precedes it will appear, that an individual of either of the four civil tribes may select his own theological sect: a Brahman, or a Sudra, is at liberty to choose what form of worship he may think proper, and to what deity he will offer it; observing, of course, due consistency and conformity with the ritual. He may thus, without offence, beyond incurring some displeasure, perhaps, from his stauncher family, and Guru, or pastor, change from a Lingi to a Yonija, or associate one with the other; or from a Saura to a Ganapatya; or he may combine all, and more; and, seeing all in Krishna, become a Bhagavata; he may, without incurring sin, or, as the idea is better understood in Europe, without *losing caste*, turn from a Saiva to a Vaishnava. All these are venial, and admit of easy expiation. He is still under the spiritual dominion of the same priesthood, and while he observes the ordained feasts and fasts, performs pilgrimages, is liberal in alms, and conforms to the externals that serve to rivet the mental chains forged for him by the Brahmans, all is well. He may also study, and, under certain limitation, believe and profess, whichever philosophical doctrines he prefers. It would not, perhaps, be thought decorous in a

Brahman, especially if he were a priest, to make an ostentatious display of the doctrines of a free-thinking founder, whose tenets border on a denial of the existence of the mythological beings, reverence to whom is the base on which rests the spiritual sanctity of his own tribe. But there are still many individuals among the Brahmans who think deeply; and who, in reasoning on the grossness and absurdity of their mythological legends, cannot but reject them. See VEDANTA.

It is in the civil distinctions that the Hindoo law is so guarded against innovation. Here every possible care has been taken to keep the tribes apart; and sexual intercourse, the principal apprehended cause of confusion, is regulated and legitimated with great precision. These regulations vary in minute particulars in different tribes and countries, but agree pretty nearly in the main point of degrading the offspring of forbidden intercourse. Such degradation does not, however, necessarily result. Rich delinquents can avert immediate ecclesiastical censure; and the lapse is soon forgotten. With the poor such things are of less moment; exciting perhaps little else than the passing scandal of the neighbourhood; unless in cases where the Brahmanical dignity or purity may be implicated in a manner too gross or notorious to be overlooked. Fornication or adultery between a male Sudra and a Brahmani would be deemed of this nature. So would eating or drinking together of individuals of remote or different tribes. But the latter, if not frequent or wilful, admit of expiation; expensive and vexatious in proportion to the wealth of the offenders, and the degree of enormity in the offence.

Some writers have told us of the ease with which the Hindoos, and even the Brahmans, seem to change their religion: "with as much facility," say they, "as their garments." The theological change of *sect*, as above noticed, is not attended with much difficulty: they are still Hindoos, and can find priests of their new persuasion, who will afford them the consolations and benefits of religion, such as they are. But the work of conversion altogether from that religion, and liberation from the trammels of priestcraft, have ever been, and ever will be found, a task of much greater difficulty: to be accomplished only by the potency of continued persuasion, superadded to the aid of example in the preceptors.

In concluding this article on the sectarial divisions of the Hindoos, we may observe that there is strong reason to believe many of them to be of modern origin. The Veda, the scripture of the Hindoos, affords no authority for such extravagancies as worshipping deified heroes, female powers or indecent symbols, or avatars. See VEDA.

We shall here subjoin a brief account of Saniasmy, omitted in its proper place. Saniasmy denotes an order of Hindoo mendicants, who arrive at this distinction by divers acts of persevering penance and supposed piety. We are not aware of any material distinction between this description of saints, and those called Yogi and Yati by different sects. In the Gita, as translated by Mr. Wilkins, Krishna declares him to be both a Yogi and a Saniasmy, who performeth that which he hath to do independent of the fruit thereof. Saniasmy, or a forsaking of the world, is declared to be the same with Yogi, or the practice of devotion. He who can bear up against the violence produced from lust and anger in this mortal life, is properly employed, and a happy man. The man who is happy in his heart, at rest in his mind, and enlightened within, is a Yogi, or one devoted to God, and of a godly spirit. The soul of the placid, conquered spirit, is the same in heat and cold, in pain and pleasure, in honour and disgrace. To the Yogi, gold, iron, and stones are the same. The man is distinguished whose resolution, whether amongst his companions and friends, or in the midst of his enemies; with those

who love and with those who hate ; in the company of saints or sinners, is the same. The Yogi constantly exerciseth the spirit in private. He is a recluse of a subdued mind, free from hope, and free from perception. He planteth his own seat firmly on a spot that is undefiled, and sitteth upon the sacred grass, *kusa*, covered with a skin and a cloth. (See KUSA.) There he, whose business is the restraining of his passion, should sit, with his mind fixed on one object alone, in the exercise of his devotion for the purification of his soul, keeping his head, his neck, and body steady, without motion, his eyes fixed on the point of his nose, looking at no other place around. To be a Saniasy, or recluse, without application, is to obtain pain and trouble.

This divine discipline is not to be attained by him who eateth more than enough, or less than enough ; neither by him who sleepeth too much, nor by him who sleepeth not at all. A man is called devout, when his mind remaineth thus regulated within himself, and he is exempted from every lust and inordinate desire. The Yogi of a subdued mind, thus employed in the exercise of devotion, is compared to a lamp standing in a place without wind, which waveth not. He becometh acquainted with that boundless pleasure, which is far more worthy of the understanding than that which arises from the senses ; depending upon which, the mind moveth not from its principles ; which having obtained, he respecteth no other acquisition so great as it ; on which depending, he is not moved by the severest pain. Supreme happiness attendeth the man whose mind is thus at peace ; whose carnal affections and passions are thus subdued ; who is thus in God, and free from sin. The Yogi is more exalted than the Tapaswi (see TAPAS) ; the zealot who harasses himself in performing penances, he is respected above the learned in science, and superior to those attached to moral works.

The above passages from different pages of the Gita, may serve as a specimen of that extraordinary work ; supposed to have been composed by Vyasa, many centuries before the Christian era. See VYASA, JAINA, YATI, and YOGI, for some farther notice of Hindoo penance and devotion ; and TAPAS, for instances of their austerity.

Individuals calling themselves Saniasys and Yogis, are still seen wandering about India ; sometimes stark-naked ; rubbed over perhaps with ashes, especially if of the sect of *Saiva* (which see) ; the god Siva being represented so powdered. Sometimes they have, like him, a tiger's skin to sit on : and at others, carry one of Vishnu's emblems, the *chakra*, of which see under VISHNU and VAJRA. In the latter case, the individuals are probably of the sect of *Vaishnava*, which see.

SECTA, in *Law*. See SUIT.

SECTA *Hundred*. See HUNDRED SUIT.

SECTA *ad curiam*, a writ which lieth against him who refuseth to perform his suit to the county court, or court baron.

SECTA *curia*. See SUIT of Court.

SECTA *facienda per illam quæ habet æniciam partem*, a writ to compel the heir that hath the elder's part among co-heirs, to perform service for all the coparceners.

SECTA *falde*. See FALDAGE.

SECTA *ad justitiam faciendam*, is a service which a man is bound to perform by his fee.

SECTA *molendini*, a writ lying where a man by usage, time out of mind, &c. has ground his corn at the mill of a certain person, and afterwards goes to another mill with his corn, thereby withdrawing his suit to the former. And this writ lies especially for the lord against his tenants, who hold of him to do suit at his mill. This is now generally turned into an action of the case.

SECTA *regalis*, a suit by which all persons were bound twice in a year to attend the sheriff's tourn, and was called *regalis*, because the sheriff's tourn was the king's leet ; wherein the people were to be obliged by oath to bear true allegiance to the king, &c.

SECTA *unica tantum facienda pro pluribus hereditatibus*, a writ that lies for an heir who is disinherited by the lord to do more suits than one, in respect of the land of divers heirs descended to him.

SECTILIA, among the Romans, pavements laid with stones cut into various forms. Suetonius distinguishes them from those that were tessellated.

SECTINEUS, in *Anatomy*, a small, flat, and pretty long muscle, broad at the upper part, and narrow at the lower ; situated obliquely between the os pubis, and the upper part of the os femoris.

It is commonly a single muscle, but is sometimes found double. It is fixed above by fleshy fibres to all the sharp ridges, or crista, of the os pubis, and to a small part of the oblong notch, or depression, on the fore side of the crista, in which the upper extremity of this muscle is lodged ; and thence it runs down obliquely towards the little trochanter, under, and a little behind which it is inserted obliquely by a flat tendon, between the superior insertion of the vastus internus, and inferior insertion of the triceps secundus, with which it is united. Winslow.

SECTIO CÆSAREA. See CÆSARIAN Section.

SECTION, SECTIO, formed from *seco*, *I cut*, a part of a thing divided : or the division itself.

Such, particularly, are the subdivisions of chapters, by others called *paragraphs*, and sometimes *articles*. The mark of a section is §.

The ancients neglected to divide their books into chapters and sections : that was a task left for future editors and critics.

SECTION, in *Geometry*, denotes a side or surface appearing of a body, or figure, cut by another ; or the place wherein lines, planes, &c. cut each other.

The common section of two planes is always a right line ; being the line supposed to be drawn by the one plane in its cutting or entering the other.

If a sphere be cut in any manner, the plane of the section will be a circle, whose centre is in the diameter of the sphere.

The sections of the cone are five, *viz.* a circle, triangle, parabola, hyperbola, and ellipsis. See each under its proper article. See also CONE.

SECTIONS, *Conic*. See CONIC Sections.

SECTION, *Axis of a Conic*. See AXIS.

SECTION, *Centre of a Conic*. See CENTER.

SECTION, *Diameter of a Conic*. See DIAMETER.

SECTION, *Tangent of a Conic*. See TANGENT.

SECTIONS, *Following, Sectiones Sequentes*, in *Conics*, may be thus conceived : suppose two right lines, as AB, CD, (*Plate XIII. Analysis, fig. 5.*) mutually intersecting one another in E, which point E is supposed to be the common centre of the opposite hyperbolic sections F, G, H, I, and whose common asymptotes, the proposed lines AB, CD, also are. In this case, the sections G, F, and H, I, are called *sectiones sequentes* ; because they are placed following one another in the contiguous angles of two intersecting right lines.

If the determinate diameter, HG, of one of the *sectiones sequentes* (which is coincident with the supposed indeterminate diameter of its opposite) be equal to the vertical tangent KL, applied between the asymptotes in the point G, of the diameter GF ; then Apollonius calls such sections, *conjugate sections*. See *Genesis of the Hyperbola*, under CONIC Sections.

SECTIONS, *Opposite*. See OPPOSITE.

SECTIONS, *Similar*. See SIMILAR.

SECTION of a *Building* denotes its profile, or a delineation of its heights and depths raised on the plan; as if the fabric was cut asunder, to discover the inside.

SECTION, *Horizontal*. See ICNOGRAPHY.

SECTIS *non Faciendis*, in *Law*, a writ brought by a woman, who for her dower, &c. ought not to perform suit of court.

SECTOR, in *Astronomy*, the name of two different astronomical instruments, for measuring small angular distances in the heavenly regions; one of which has a motion in or parallel to the equator, and the other is directed to the zenith. The construction and use of each of these instruments may be seen under the respective titles of EQUATORIAL *Sector*, and ZENITH *Sector*.

SECTOR, in *Geometry*, a part of a circle comprehended between the radii and the arc.

Thus the mixed triangle ACD (*Plate XIII. Geometry, fig. 5.*) comprehended between the radii AC and CD, and the arc AD, is a *sector of the circle*.

It is demonstrated by geometricians, that the sector of a circle, as ACD, is equal to a triangle, whose base is the arc AD, and its altitude the radius AC.

If from the common centre of two concentric circles be drawn two radii to the periphery of the outer, the two arcs included between the radii will have the same ratio to their peripheries; and the two sectors, the same ratio to the areas of their circles.

To find the area of a sector DCE; the radius of the circle CD, and the arc DE, being given. To 100,314, and the radius DC, find a fourth proportional number; this will be the semiperiphery: then to 180 degrees, the given arc DE, and the semiperiphery just found, find another fourth proportional; this will give the arc DE in the same measure in which the radius DC is given: lastly, multiply the arc DE into the semiradius, and the product is the area of the sector.

In order to find the area of any sector of a circle, Dr. Hutton, in his "Mensuration," has given the two following rules.

Rule I.—Multiply the radius by half the arc of the sector, and the product will be the area, as in the whole circle. For the demonstration of this, see the article CIRCLE. Putting r = the radius of a circle, d = the diameter, A = the area of a sector of it, a = the length of the arc of the sector, b = the degrees in $\frac{1}{2}a$, s = half the chord of the arc a , or the sine of $\frac{1}{2}a$, and v = the versed sine of $\frac{1}{2}a$: then, by multiplying the radius by half the arc, by a variety of rules which Dr. Hutton has stated, we shall have,

$$1. A = \frac{1}{2}ar = .1745329 brr. \quad 2. A = r \sqrt{dv} \times (1 + \frac{v}{2.3d} + \frac{3v^2}{2.4.5d^2} + \frac{3.5v^3}{2.4.6.7d^3}, \&c.) \quad 3. A = rs \times (1 + \frac{s^2}{2.3r^2} + \frac{3s^4}{2.4.5r^4} + \frac{3.5s^6}{2.4.6.7r^6}, \&c.)$$

$$4. A = 4 \sqrt{\frac{ss + vv - s}{3}} r = 4 \sqrt{\frac{2rv - s}{3}} r = 4 \sqrt{\frac{ss + vv - s}{3}} \times \frac{ss + vv}{2v}. \quad 5. A = r d \sqrt{\frac{3v}{3d - v}}, \text{ nearly.} \quad 6. A = \frac{r}{q} \times (5d \sqrt{\frac{5v}{5d - 3v}} + 4 \sqrt{\frac{2v}{dv}}, \text{ nearly.}$$

It appears that the area of the

sector might be expressed in several other ways; such as by the tangent, cosine, &c. of its semi-arc; but the forms above given are those that are the most useful.

Rule II.—As 360 is to the degrees in the arc of the sector, so is the whole area of the circle to the area of the sector.

SECTOR also denotes a mathematical instrument, of great use in finding the proportion between quantities of the same kind; as between lines and lines, surfaces and surfaces, &c.: whence the French call it the *compas of proportion*.

The great advantage of the sector above the common scales, &c. is, that it is made so as to fit all radiuses, and all scales. By the lines of chords, sines, &c. on the sector, we have lines of chords, sines, &c. to any radius betwixt the length and breadth of the sector when open.

The sector is founded on the fourth proposition of the sixth book of Euclid; where it is demonstrated, that similar triangles have their homologous sides proportional. An idea of the theory of its construction may be conceived thus. Let the lines AB, AC (*Plate XIII. Geometry, fig. 6.*) represent the legs of the sector; and AD, AE, two equal sections from the centre: if, now, the points CB and DE be connected, the lines CB and DE will be parallel: therefore the triangles ADE, ACB, will be similar; and, consequently, the sides AD, DE, AB, and BC, proportional; that is, as AD : DE :: AB : BC; whence, if AD be the half, third, or fourth part of AB, DE will be a half, third, or fourth part of CB; and the same holds of all the rest.

If, therefore, AD be the chord, sine, or tangent, of any number of degrees to the radius AB; DE will be the same to the radius BC.

SECTOR, *Description of the*. The instrument consists of two rulers, or legs, of brass or ivory, or any other matter, representing the radii, moveable round an axis or joint, the middle of which expresses the centre; whence several scales are drawn on the faces of the rulers. See *Plate XIII. Geometry, fig. 7.*

The scales generally put on sectors may be distinguished into single and double. The single scales are such as are commonly put upon plain scales; the double scales are those which proceed from the centre: each scale is laid twice on the same face of the instrument, viz. once on each leg: from these scales, dimensions or distances are to be taken, when the legs of the instrument are in an angular position.

The scales commonly put upon the best sectors are

Single.	a line of	1	Inches, each inch divided into 8 and 10 parts.	marked
		2	Decimals, containing 100 parts.	
		3	Chords,	
		4	Sines,	
		5	Tangents,	
		6	Rhumbs,	
		7	Latitude,	
		8	Hours,	
		9	Longitude,	
		10	Inclin. Merid.	
		11	the Numbers,	
		12	Logarithms	
		13	of Sines,	
		14	of Versed sines, Tangents,	
Double.	a line of	1	Lines, or of equal parts,	marked
		2	Chords,	
		3	Sines,	
		4	Tangents to 45°,	
		5	Secants,	
		6	Tangents to above 45°,	
		7	Polygons,	
				Cho. Sin. Tang. Rum. Lat. Hou. Lon. In. Mer. Num. Sin. V. Sin. Tan. Lin. Cho. Sin. Tan. Sec. Tan. Pol.

SECTOR.

The manner in which these scales are disposed of on the sector, is best seen in the figure.

The scales of lines, chords, sines, tangents, rhumbs, latitudes, hours, longitude, incl. merid. may be used, whether the instrument is shut or open, each of these scales being contained on one of the legs only. The scales of inches, decimals, log. numbers, log. sines, log. versed sines, and log. tangents, are to be used with the sector quite opened, part of each scale lying on both legs.

The double scales of lines, chords, sines, and lower tangents, or tangents under 45 degrees, are all of the same radius or length: they begin at the centre of the instrument, and are terminated near the other extremity of each leg; viz. the lines at the division 10, the chords at 60, the sines at 90, and the tangents at 45; the remainder of the tangents, or those above 45 degrees, are on other scales beginning at one-fourth of the length of the former, counted from the centre, where they are marked with 45, and run to about 76 degrees.

The secants also begin at the same distance from the centre, where they are marked with 10, and are from thence continued to as many degrees as the length of the sector will allow, which is about 75 degrees.

The angles made by the double scales of lines, of chords, of sines, and of tangents, to 45 degrees, are always equal. And the angles made by the scales of upper tangents, and of secants, are also equal; and sometimes these angles are made equal to those made by the other double scales. The scales of polygons are put near the inner edge of the legs, their beginning is not so far removed from the centre, as the 60 on the chords is. Where these scales begin, they are marked with 4, and from thence are figured backwards, or towards the centre, to 12.

From this disposition of the double scales, it is plain, that those angles which were equal to each other, while the legs of the sector were close, will still continue to be equal, although the sector be opened to any distance it will admit of.

The scale of inches is laid close to the edge of the sector, and sometimes on the edge; and contains as many inches as the instrument will receive when opened: each inch being usually divided into eight, and also into ten equal parts. The decimal scale lies next to this: it is of the length of the sector, when opened, and is divided into ten equal parts, or primary divisions, and each of these into ten other equal parts; so that the whole is divided into a hundred equal parts: and if the sector admits of it, each of the subdivisions is divided into two, four, or five parts; and by this decimal scale, all the other scales, that are taken from tables, may be laid down. The length of a sector is usually understood when it is shut; and, therefore, a sector of six inches makes a ruler of twelve inches when opened; and a foot sector is two feet long, when quite opened. The scales of chords, rhumbs, sines, tangents, hours, latitudes, longitudes, and inclinations of meridians, are such as are described under *Plane SCALE*.

The scale of logarithmic or artificial numbers, called Gunter's scale, or Gunter's line, is a scale expressing the logarithms of common numbers, taken in their natural order.

For the construction of this scale, and also of those of logarithmic sines, logarithmic tangents, and logarithmic versed sines, see *GUNTER'S Line*, and *GUNTER'S Scale*.

We shall here observe, that all these scales should have one common termination to one end of each scale, i. e. the 10 on the numbers, the 90 on the sines, the 0 on the versed sines, and the 45 on the tangents, should be opposite to

each other: the other end of each of the scales of sines, versed sines, and tangents, will run out beyond the beginning (marked 1) of the numbers; nearly opposite to which will be the divisions representing 35 minutes on the sines and tangents, and 168½ degrees on the versed sines.

The double scales are constructed in the following manner. The line of lines is only a scale of equal parts, whose length is adapted to that of the legs of the sector: thus, in the six-inch sector, the length is about 5¾ inches. The length of this scale is divided into primary divisions; each of these into ten equal secondary parts; and each secondary division into four equal parts. The accuracy of the division may be determined by taking between the compasses any number of equal parts from this line, and applying that distance to all the parts of the line; and if the same number of divisions be contained between the points of the compasses in every application, the scale may be received as perfect. The line of sines is constructed by making the whole length of this scale equal to that of the line of lines; and from this line, taking off severally the parts expressed by the numbers in the tables of the natural sines, corresponding to the degrees, or to the degrees and minutes, intended to be laid upon the scale: and then by laying down these several distances on the scale, beginning from the centre. In scales of this length, it is customary to lay down divisions, expressing every 15 minutes, from 0 degree to 60 degrees; between 60 and 80 degrees, every half degree is expressed; then every degree to 85; and the next is 90 degrees. The length of the scale of tangents is equal to that of the line of lines, and the several divisions upon it (to 45 degrees) are laid down from the tables and line of lines, in the same manner as the former; observing to use the natural tangents in the tables. The scale of upper tangents is laid down, by taking ¼ of such of the natural tabular tangents above 45 degrees, as are intended to be put upon the scale. The beginning of this scale, at 45 degrees, though the position of it on the sector respects the centre of the instrument, is distant from the centre ¼ of the length or radius of the lower tangents.

The distance of the beginning of the scale of secants from the centre, and the manner of laying it down, are the same as those of the upper tangents: except that in this the tabular secants are to be used.

For the scale of chords; its length is to be made equal to that of the sines; and the divisions, which are twice the length of the sines of half the degrees and minutes counted from the centre, express every 15 minutes from 0 degrees to 60 degrees, to be laid down as in the scale of sines.

The scale of polygons usually comprehends the sides of the polygons from six to twelve sides inclusive. The divisions are laid down by taking the lengths of the chords of the angles at the centre of each polygon, and laying them down from the centre of the instrument. When the polygons of four and five sides are also introduced, this line is constructed from a scale of chords, where the length of 90 degrees is equal to that of 60 degrees of the double scale of chords on the sector. Instead of some of the double scales above described, there are found other scales on the old sectors, and also on some of the French ones, such as scales of superficies, of solids, of inscribed bodies, of metals, &c.; but these are left out to make room for others of more general use. See *CALIBER*.

In describing the use of the sector, the terms *lateral distance*, and *transverse distance*, often occur. By the former is meant the distance taken with the compasses on one of the scales only, beginning at the centre of the sector; and by the latter, the distance taken between any two corresponding

SECTOR.

responding divisions of the scales of the same name, the legs of the sector being in an angular position: but in taking these transverse distances, it is to be observed, that each of the several scales hath three parallel lines, across which the divisions of the scale are marked, and that the points of the compasses must be always set on the inside line, or that line next the inner edge of the leg, which is the only line, in each scale, which runs to the centre.

For the use of the logarithmic scale of numbers, see *GUNTER'S Line*.

SECTOR, Use of the Line of Lines on the. 1. To divide a given line into any number of equal parts; *e. g.* 9. Make the length of the given line, or some known part of it, a transverse distance to 9 and 9: then will the transverse distance of 1 and 1 be the $\frac{1}{9}$ th part of it; or such a submultiple of the $\frac{1}{9}$ th part, as was taken of the given line: or the $\frac{1}{9}$ th part will be the difference between the given line and the transverse distance of 8 and 8.

Hence, 2. To make a scale of a given length, to contain a given number of equal parts; *e. g.* let the scale to the map of a survey be 6 inches long, and contain 140 poles, and let it be required to open the sector, so that a corresponding scale may be taken from the line of lines. Make the transverse distance 7 and 7 (or 70 and 70, *viz.* $1\frac{1}{2}^{\circ}$) equal to 3 inches ($= \frac{3}{4}$); and this position of the line of lines will produce the given scale.

3. To divide a given line (*e. g.* of 5 inches) into any assigned proportion, as of 4 to 5. Make 5 inches, the length of the given line, a transverse distance to 9 and 9, the sum of the proposed parts; and the transverse distances of the assigned numbers, 4 and 5, will be the parts required.

4. To two given lines, *viz.* 2 and 6, to find a third proportional. Take between the compasses the lateral distance of the second term, *viz.* 6; set one point on the division expressing the first term, *viz.* 2 on one leg, and open the legs of the sector till the other point will fall on the corresponding division on the other leg: keeping the legs of the sector in this position, take the transverse distance of the second term, *viz.* 6, and this distance is the third term required, which distance, measured laterally from the centre, will give 18, the number required: for $2 : 6 :: 6 : 18$. Otherwise, take the distance 2 laterally, and apply it transversely to 6 and 6, the sector being properly opened: then the transverse distance at 2 and 2, being taken with the compasses, and applied laterally from the centre of the sector on the scale of lines, will give the third term, when the proportion is decreasing; for $6 : 2 :: 2 : \frac{2}{3}$. If the legs of the sector will not open so far as to let the lateral distance of the second term fall between the divisions expressing the first term; then take $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, or any aliquot part of the second term, that will conveniently fall within the opening of the sector, and make such part the transverse distance of the first term: then, if the transverse distance of the second term be multiplied by the denominator of the part taken of the second term, the product will give the third term.

5. To three given lines, *viz.* 3, 7, and 10, to find a fourth proportional. Open the legs of the sector, till the transverse distance of the first term, 3, be equal to the lateral distance of the second term, 7, or to some part of it; then will the transverse distance of the third term, 10, give the fourth term, $23\frac{1}{3}$, required; or such a submultiple of it, as was taken of the second term; for $3 : 7 :: 10 : 23\frac{1}{3}$. Otherwise, set the lateral distance, 7, transversely from 10 to 10, opening the sector accordingly; and the transverse distance, at 3 and 3, applied laterally, will give $2\frac{1}{3}$; for $10 : 7 :: 3 : 2\frac{1}{3}$.

6. To diminish a line of four inches, in the proportion of

10

8 to 7. Open the sector till the transverse distance of 8 and 8 be equal to the lateral distance of 7: mark the point, where four inches, as a lateral distance, taken from the centre, reaches; and the transverse distance taken at that point will be the line required. If the line should be too long for the legs of the sector, take $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{4}$, &c. part of the given line for the lateral distance, and the corresponding transverse distance, taken twice, thrice, or four times, &c. will be the line required.

7. To open the sector, so that the two scales of lines shall make a right angle. Take the lateral distance from the centre to the division marked 5, between the points of the compasses, and set one foot in the division marked 4, on one of the scales of lines; and open the legs of the sector till the other foot falls on the division marked 3, on the other scale of lines, and then will those scales stand at right angles to one another; for the lines 3, 4, 5, or any of their multiples, constitute a right-angled triangle.

8. To two right lines given, *e. g.* 40 and 90, to find a mean proportional. Set the two scales of lines at right angles; find the half sum of the given lines, *viz.* 65, and the half difference, *viz.* 25, and take with the compasses the lateral distance of the half sum, 65, and apply one foot to the half difference, 25, the other foot transversely will reach to 60, the mean proportional required; for $40 : 60 :: 60 : 90$.

SECTOR, Use of the Scale of Chords on the. 1. To open the sector so that the two scales of chords may make an angle of any number of degrees, *e. g.* 40. Take the distance from the joint to 40, the number of degrees proposed on the scale of chords; open the sector till the transverse distance from 60 to 60, on each leg, be equal to the aforesaid lateral distance of 40: then do the scales of chords make the angle required.

2. The sector being opened, to find the degrees of its aperture. Take the extent from 60 to 60, and lay it off on the scale of chords from the centre: the number, where it terminates, shews the degrees of its opening. By applying sights on the scales of chords, the sector may be used to take angles, as a surveying instrument.

3. To protract or lay down an angle of any given number of degrees. 1. Let the number of degrees be less than 60, *viz.* 46. At any opening of the sector, take the transverse distance of 60 and 60 on the chords; and with this opening describe an arc: take the transverse distance of the given number of degrees, 46, and lay this distance on the arc described, marking its extremities: from the centre of the arc, through these extremities, draw two lines, and they will contain the angle required. 2. When the degrees given are more than 60, *viz.* 148; describe the arc as before; take the transverse distance of $\frac{1}{2}$ or $\frac{1}{3}$ of the given degrees, 148, *e. g.* $\frac{1}{2} = 49\frac{1}{2}$ degrees: lay this distance on the arc thrice: and from the centre draw two lines to the extremities of the arc thus determined, and they will contain the required angle. N. B. If the radius of the arc or circle is to be of a given length, then make the transverse distance of 60 and 60, equal to that assigned length.

4. To find the degrees which a given angle contains. About the vertex describe an arc, and open the sector till the distance from 60 to 60, on each leg, be equal to the radius of the circle; then taking the chord of the arc between the compasses, and carrying it on the legs of the sector, see what equal number, on each leg, the points of the compasses fall on: this is the quantity of degrees the given angle contains.

5. To take an arc, of any quantity, from off the circumference of a circle. Open the sector till the distance from

from

SECTOR.

from 60 to 60 be equal to the radius of the given circle; then take the extent of the chord of the number of degrees, on each leg of the sector, and lay it off on the circumference of the given circle. By this use, may any regular polygon be inscribed in a given circle, as well as by the line of polygons: *e. g.* in a circle whose diameter is given to describe a regular polygon of 24 sides. Make the given diameter a transverse distance from 60 to 60 on the scales of chords; divide 360 by 24, and take the transverse distance of 15 and 15, the quotient, and this will be the chord of the twenty-fourth part of the circumference. In order to prevent errors, where the distance is to be repeated several times, it will be best to proceed thus: with the chord of 60 degrees divide the circumference into six equal parts; in every division of 60 degrees lay down, first, the chord of 15 degrees, and next the chord of 30 degrees, and then the chord of 45 degrees, beginning always at the same point. Thus the error in taking distances will not be multiplied into any of the divisions following the first.

SECTOR, Use of the Line of Polygons on the. 1. In a given circle to inscribe a regular polygon, *e. g.* an octagon. Open the legs of the sector, till the transverse distance of 6 and 6 be equal to the given diameter, then will the transverse distance of 8 and 8 be the side of an octagon, which may be inscribed in the given circle. In like manner may any other polygon, the number of whose sides does not exceed 12, be inscribed in a given circle.

2. On a given line to describe a regular polygon, *e. g.* a pentagon. Make the given line a transverse distance to 5 and 5: at that opening of the sector, take the transverse distance of 6 and 6; and with this radius, on the extremities of the line, as centres, describe arcs intersecting each other; and on the point of intersection, as a centre, with the same radius, describe a circumference passing through the extremities of the given line; and in this circle may the pentagon, whose side is given, be inscribed. By a like process may any other polygon, of not more than 12 sides, be described on a given line.

3. On a right line, to describe an isosceles triangle, having the angles at the base double that at the vertex. Open the sector till the ends of the given line fall on 10 and 10 on each leg: then take the distance from 6 to 6; this will be the length of the two equal sides of the triangle.

SECTOR, Use of the Scales of Sines, Tangents, and Secants on the. By the several lines disposed on the sector, we have scales to several radiuses: so that, 1, having a length, or radius, given, not exceeding the length of the sector when opened, we find the chord, sine, &c. thereto: *e. g.* suppose the chord, sine, or tangent, of 10 degrees to a radius of three inches required. Make three inches the aperture, or transverse distance, between 60 and 60 on the scales of chords of the two legs; then will the same extent reach from 45 to 45 on the scale of tangents, and from 90 to 90 on the scale of sines on the other side: so that to whatever radius the line of chords is set, to the same are all the others set. In this disposition, therefore, if the aperture, or transverse distance, between 10 and 10, on the scales of chords, be taken with the compasses, it will give the chord of 10 degrees; if the transverse distance of 10 and 10 be in like manner taken, on the scales of sines, it will be the sine of 10 degrees: lastly, if the transverse distance of 10 and 10 be in like manner taken on the scales of tangents, it gives the tangent of 10 degrees to the same radius.

2. If the chord, or tangent, of 70 degrees were required, for the chord, the transverse distance of half the arc, *viz.* 35, must be taken, as before; which distance, being repeated twice, gives the chord of 70 degrees. To find the

tangent of 70 degrees, to the same radius, the scale of upper tangents must be used, the other only reaching to 45: making, therefore, three inches the transverse distance between 45 and 45 at the beginning of that scale; the extent between 70 and 70 degrees, on the same, will be the tangent of 70 degrees to three inches radius.

3. To find the secant of an arc, make the given radius the transverse distance between 0 and 0 on the line of secants; then will the transverse distance of 10 and 10, or 70 and 70, on the said lines, give the secant of 10 degrees, or 70 degrees.

The scales of upper tangents and secants do not run quite to 76 degrees; but those of a greater number of degrees may be found by the sector in the following manner. Thus, the tangent of any number of degrees may be taken from the sector at once; if the radius of the circle can be made a transverse distance to the complement of those degrees on the lower tangent. *E. g.* To find the tangent of 78 degrees to a radius of two inches. Make two inches a transverse distance of 12 degrees on the lower tangents; then the transverse distance of 45 degrees will be the tangent of 78 degrees. In like manner the secant of any number of degrees may be taken from the fines, if the radius of the circle can be made a transverse distance to the cosine of those degrees. Thus, making two inches a transverse distance to the sine of 12 degrees, then the transverse distance of 90 and 90 will be the secant of 78 degrees. Hence it will be easy to find the degrees answering to a given line, expressing the length of a tangent or secant, which is too long to be measured on those scales, when the sector is set to the given radius. Thus, for a tangent, make the given line a transverse distance to 45 and 45 on the lower tangents; then take the given radius, and apply it to the lower tangents: and the degrees, where it becomes a transverse distance, give the cotangent of the degrees answering to the given line. And for a secant, make the given line a transverse distance to 90 and 90 on the fines: then the degrees answering to the given radius, applied as a transverse distance on the fines, will be the cosine of the degrees answering to the given secant line.

4. If the converse of any of these things were required, that is, if the radius be required, to which a given line is the sine, tangent, or secant; it is but making the given line, if a chord, the transverse distance on the line of chords, between 10 and 10, and then the sector will stand at the radius required; that is, the aperture between 60 and 60, on the said line, is the radius.

If the given line were a sine, tangent, or secant, it is but making it the transverse distance of the given number of degrees; then will the distance of 90 and 90 on the fines, of 45 and 45 on the lower tangents near the end of the sector, and of 45 and 45 on the upper tangents towards the centre of the sector, and of 0 and 0 on the secants, be the radius.

5. If the radius, and any line representing a sine, tangent, or secant, be given, the degrees corresponding to that line may be found by setting the sector to the given radius, according as a sine, tangent, or secant, is concerned; taking the given line between the compasses, applying the two feet transversely to the scale concerned, and sliding the feet along till they both rest on like divisions on both legs; and the divisions will shew the degrees and parts corresponding to the given line.

For the method of determining the degrees answering to any tangent, or secant, that cannot be thus measured, see above.

6. To find the length of a versed sine to a given number of degrees, and a given radius. Make the transverse distance

SECTOR.

tance of 90 and 90 in the fines equal to the given radius; take the transverse distance of the fine complement of the given degrees; if the given degrees are less than 90, the difference, but if greater, the sum of the fine complement and radius gives the versed sine.

7. To open the legs of the sector so that the corresponding double scales of lines, chords, fines, tangents, may make, each of them, a right angle. On the lines, make the lateral distance 10, a distance between 8 on one leg, and 6 on the other leg; on the fines, make the lateral distance 90 a transverse distance from 45 to 45, or from 40 to 50, or from 30 to 60, or from the fine of any degrees to their complement; or, on the fines, make the lateral distance of 45 a transverse distance between 30 and 30.

SECTOR, in *Trigonometry, Use of the.* 1. The base and perpendicular of a right-angled triangle being given, to find the hypotenuse. Suppose the base AC (*Plate Trigonometry, fig. 5.*) 40 miles, and the perpendicular AB 30; open the sector till the two scales of lines make a right angle; then, for the base, take 40 parts on the scale of lines on one leg; and, for the perpendicular, take 30 on the same scale on the other leg; then the extent from 40 on the one to 30 on the other, taken in the compasses, will be the length of the hypotenuse; which line, applied to the scale of lines, will be found 50 miles.

2. The perpendicular AB of a right-angled triangle ABC being given, 30, and the angle BCA 37 degrees; to find the hypotenuse BC. Take the given side AB, and set it over, on each side, on the fine of the given angle ACB; then the parallel distance of 90 and 90 or radius, will be the hypotenuse BC; which will measure 50 on the scale of lines.

3. The hypotenuse and base being given, to find the perpendicular. Open the sector till the two scales of lines be at right angles; then lay off the given base on one of those scales from the centre; take the hypotenuse in your compasses, and setting one foot in the term of the given base, let the other fall on the scale of lines on the other leg; the distance from the centre to the point where the compasses fall will be the length of the perpendicular.

4. The hypotenuse being given, and the angle ACB; to find the perpendicular. Make the given hypotenuse a parallel radius, *i. e.* make it the extent from 90 to 90 on the scales of fines; then will the parallel fine of the angle ACB be the length of the side AB.

5. The base and perpendicular AB given, to find the angle BCA. Lay off the base AC, on both sides the sector, from the centre, and note its extent; then take the given perpendicular, and to it open the sector in the terms of the base; the parallel radius will be the tangent of BCA.

6. In any right-lined triangle, two sides being given, with the included angle; to find the third side. Suppose the side AC (*fig. 6.*) 20, the side BC 30, and the included angle ACB 110 degrees; open the sector till the two scales of lines make an angle equal to the given angle, *viz.* 110 degrees; lay off the given sides of the triangle, from the centre of the sector, on each of the scales of lines; the extent between their extremes is the length of the side AB sought.

7. The angles CAB and ACB given, and the side CB; to find the base AB. Take the given side CB, and turn it into the parallel fine of its opposite angle CAB; and then the parallel fine of the angle ACB will be the length of the base AB.

8. The three angles of a triangle being given; to find the proportion of the sides. Take the lateral fines of the several angles, and measure them in the scale of lines; the numbers answering to which give the proportion of the sides.

9. The three sides being given, to find the angle ACB. Lay the sides AC, CB, along the scales of lines, from the centre, and set over the side AB in their terms; so is the sector opened, in these lines, to the quantity of the angle ACB.

10. The hypotenuse AC (*fig. 7.*) of a right-angled spherical triangle ABC, given, *e. g.* 43 degrees, and the angle CAB 20 degrees; to find the side CB. The rule is, as radius is to the fine of the given hypotenuse 43 degrees, so is the fine of the given angle 20 degrees to the fine of the perpendicular CB. Take then 20 degrees from the centre, along the scale of fines, in your compasses, and set the extent from 90 to 90 on the two legs; and the parallel fine of 43 degrees, the given hypotenuse, will, when measured from the centre on the scale of fines, give $13^{\circ} 30'$, the side required.

11. The perpendicular BC, and the hypotenuse AC, given, to find the base AB. As the fine complement of the perpendicular BC is to radius, so is the fine complement of the hypotenuse to the fine complement of the base. Therefore make the radius a parallel fine of the complement of the given perpendicular, *e. gr.* $76^{\circ} 30'$; then the parallel fine of the complement of the hypotenuse, *e. gr.* 47° , measured along the scale of fines, will be found $49^{\circ} 25'$, the complement of the base required; consequently the base itself will be $40^{\circ} 35'$.

SECTOR, in *Geometry, &c. particular uses of the.* 1. To make a regular polygon, whose area shall be of any given magnitude. Let the figure required be a pentagon, whose superficial area is 125 feet; extract the square root of $\frac{1}{5}$ of 125, it will be found 5. Make a square, whose side is 5 feet; and, by the line of polygons, as already directed, make the isosceles triangle CGD (*Plate XIII. Geometry, fig. 8.*) so as that CG being the semi-diameter of a circle, CD may be the side of a regular pentagon inscribed in it; then let fall the perpendicular GE. Then continuing the lines EG and EC, make EF equal to the side of the square before made; and from the point F, draw the right line FH parallel to GC; then a mean proportional between GE and EF will be equal to half the side of the polygon sought, which, doubled, will give the whole side. The side of the pentagon thus had, the pentagon itself may be described, as above directed.

2. A circle being given, to find a square equal to it. Divide the diameter into fourteen equal parts, by the scale of lines, as above directed; then will 12.4 of those parts, found by the same line, be the side of the square sought.

3. A square being given, to find the diameter of a circle equal to it. Divide the side of the square into eleven equal parts, by means of the scale of lines; and continue that side to 12.4 parts; this will be the diameter of the circle required.

4. To find the side of a square equal to an ellipsis, whose transverse and conjugate diameters are given. Find a mean proportional between the transverse and conjugate diameters; which being divided into fourteen equal parts, $12\frac{1}{7}$ of it will be the side of the square required.

5. To describe an ellipsis in any given ratio of its diameter, the area of which shall be equal to a given square. Suppose the proportion of the transverse and conjugate diameters be required, as 2 to 1; divide the side of the given square into eleven equal parts; then, as 2 is to 1, so is $11 \times 14 = 154$ to a fourth number; the square root of which is the conjugate diameter sought. Then, as 1 is to 2, so is the conjugate diameter to the transverse. Now,

6. To describe an ellipsis, by having the transverse and conjugate diameters given. Let the two diameters AB, CD,

CD, bisect each other at right angles in E (*Plate XIII. Geometry, fig. 9.*) Make AE a transverse diameter to go and go on the fines; and take the transverse distances of 10° , 20° , 30° , 40° , 50° , 60° , 70° , 80° , successively, and apply those distances to AE from E towards A, as at the points 1, 2, 3, 4, 5, 6, 7, 8; and through those points draw lines parallel to EC; make EC a transverse distance to go and go on the fines; take the transverse distances of 80° , 70° , 60° , 50° , 40° , 30° , 20° , 10° , successively, and apply those distances to the parallel lines from 1 to 1, 2 to 2, 3 to 3, 4 to 4, 5 to 5, 6 to 6, 7 to 7, 8 to 8, and so many points will be obtained, through which the curve of the ellipsis is to pass. The same work being done in all the four quadrants, the elliptical curve may be completed. In the construction of solar eclipses, instead of using the fines to every ten degrees, the fines belonging to the degrees and minutes corresponding to the hours and quarter hours, are to be used.

7. To describe a parabola whose parameter shall be equal to a given line. Draw a line to represent the axis, in which make AB (*fig. 10.*) equal to half the given parameter; divide AB, like a line of fines, into every ten degrees, as at the points 10, 20, 30, 40, 50, &c. and through these points draw lines at right angles to the axis AB. Make the lines Aa, 10b, 20c, 30d, 40e, &c. respectively equal to the chords of 90° , 80° , 70° , 60° , 50° , &c. to the radius AB, and the points a, b, c, d, e, &c. will be in the curve of a parabola; and a smooth curve line drawn through those points, and the vertex B, will represent the parabolic curve required.

N. B. As the chords on the sector run no farther than 60° , those of 70° , 80° , and 90° , may be found by taking the transverse distance of the fines of 35° , 40° , 45° , to the radius AB, and applying those distances twice along the lines 20c, 10b, &c.

8. To describe an hyperbola, the vertex A, and asymptotes BH, BI, being given (*fig. 11.*) The asymptotes BH, BI, being drawn, the line BA bisecting the angle IBH, and the vertex A taken, draw AI, AC, parallel to BH, BI. Make AC a transverse distance to 45 and 45, on the upper tangents, and apply to the asymptotes from B so many of the upper tangents taken transversely as may be thought convenient, as BD 50° , BE 55° , BF 60° , BG 65° , BH 70° , &c. and draw Dd, Ee, &c. parallel to AC. Make AC a transverse distance to 45 and 45, on the lower tangents; take the transverse distances of the cotangents before used, and lay them on those parallel lines: thus, make Dd = 40° , Ee = 35° , Ff = 30° , Gg = 25° , Hh = 20° , &c. and through the points A, d, e, f, g, h, &c. draw a curve line, which will be the hyperbola required.

SECTOR, in *Surveying, Use of the.* The bearings of three places, as A, B, C (*Plate VII. Surveying, fig. 1.*) to each other, i. e. the angles ABC, BCA, and CAB, being given; and the distance of each, from a fourth standing among them, as D, i. e. BD, DC, and AD, being given; to find the distances of the several places A, B, C, from each other, i. e. to find the lengths of the sides AB, BC, AC. Having drawn the triangle EFG (*fig. 2.*) similar to ABC, divide the side EG in H, so that EH may be to HG, as AD to DC, after the manner already directed; and after the like manner must EF be divided in I, so that EI may be to IF as AD to DB. Then continuing the sides EG, EF, say, as EH = HG is to HG, so is EH + HG to GK; and as EI - IF is to IF, so let EI + IF be to FM; which proportions are easily wrought by the scales of lines on the sector. This done, bisect HK and IM in the points L, N; and about the said points as centres, with the distances LH and IN,

describe two circles, intersecting each other in the point O; to which, from the angles E, F, G, draw the right lines EO, FO, and OG, which will have the same proportion to each other, as the lines AD, BD, DC. Now, if the lines EO, FO, and GO, be equal to the given lines AD, BD, DC, the distances EF, FG, and EG, will be the distances of the places required. But if EO, OF, OG, be less than AD, DB, DC, continue them till PO, OR, and OQ, be equal to them; then the points P, Q, R, being joined, the distances PR, RQ, and PQ, will be the distances of the places sought. Lastly, if the lines EO, OF, OG, be greater than AD, DB, DC, cut off from them lines equal to AD, BD, DC, and join the points of section by three right lines; the lengths of the said three right lines will be the distances of the three places sought.

Note, if EH be equal to HG, or EI to IF, the centres L and N will be infinitely distant from H and I; that is, in the points H and I there must be perpendiculars raised to the sides EF, EG, instead of circles, till they intersect each other; but if EH be less than HG, the centre L will fall on the other side of the base continued; and the same is to be understood of EI, IF.

The sector is of especial use for facilitating the projection of the sphere, both orthographic and stereographic.

See on the construction and use of the sector, Bion's *Construction, &c. of Mathematical Instruments*, by Stone, p. 54, &c. edit. 1. and Robertson's *Treatise of Mathematical Instruments*, &c. p. 30, &c. edit. 2.

SECTOR of a Sphere, is composed of a segment less than a hemisphere, and of a cone having the same base with the segment, and its vertex in the centre of the sphere. The sector of a sphere, generated by the revolution of the sector of a circle CAE (*Plate III. Geometry, fig. 12.*) about the radius AC, is equal to a cone, whose base is equal to the portion of the spherical surface generated by the arc AE, or to the circle described with the radius AE, and whose height is equal to CA the radius of the sphere. Arch. de Sphær. et Cyl. Maclaurin's *Fluxions*, Introd. p. 15. See SPHERE.

SECUL, in *Geography*, a town of European Turkey, in the province of Moldavia; 5 miles S.W. of Niemez.

SECULAR, something that is *temporal*; in which sense the word stands opposite to *ecclesiastical*.

Thus we say, secular power, secular arm, secular jurisdiction, &c.

SECULAR is more peculiarly used for a person who lives at liberty in the world; not shut up in a monastery, nor bound by vows, nor subjected to the particular rules of any religious community.

In which sense the word stands opposed to *regular*.

The Romish clergy is divided into *regular* and *secular*.

The regulars pretend, that their state is much more perfect than that of the seculars. Secular priests may hold abbeys and priories both simple and conventual, though not regularly, but only in *commendam*.

It is a maxim, in their canon law, *secularia secularibus, i. e.* secular benefices are only to be given to secular persons; regular only to regular.

SECULAR Corporation. See CORPORATION.

SECULAR Games, *Ludi Seculares*, in *Antiquity*, were solemn games held among the Romans, once in an age; or, in a period deemed the extent of the longest life of man, called by the Greeks *αἰών*, and by the Latins *seculum*.

The secular games were also called *Terentine games, ludi Terentini*, either because Manius Valerius Terentinus gave occasion to their institution; for having been warned, in a dream,

dream, to dig in the ground in a place near the Campus Martius, called *Terentum*, he there found an altar inscribed to Dis, or Pluto and Proserpine; upon which, as had been foretold him in his dream, three of his children, born blind, obtained their sight; and he, in gratitude, performed sacrifices on the same altar, for three days and three nights successively. Or, finally, by reason here was an altar of Pluto buried deep under ground, because the water of the Tyber, *terram tereret*, eat into the ground in this place.

The secular games lasted three days, and as many nights; during which time sacrifices were performed, theatrical shows exhibited, with combats, sports, &c. in the Circus.

Their origin and institution are delivered at length by Val. Maximus; the occasion of which, according to this writer, was to stop the progress of a plague. The first who had them celebrated at Rome, was Valerius Publicola, the first consul created after the expulsion of the kings, in the year of Rome 245. The ceremonies to be observed in them were found prescribed in one of the books of the Sibyls; in which was contained a prophecy to this effect; *viz.* that if the Romans at the beginning of every age should hold solemn games in the Campus Martius to the honour of Pluto, Proserpine, Juno, Apollo, Diana, Ceres, and the Parcae, their city should ever flourish, and all nations be subjected to their dominions. Accordingly, they were very ready to obey the oracle, and in all the ceremonies used on this occasion conformed to its directions.

At the time of the celebration of the secular games, heralds were sent to invite all the world to a solemnity which nobody had ever yet seen, nor was ever to see again.

They were introduced with extraordinary preparation, under the direction of the quindecimviri; who distributed to the people flambeaux and sulphur, and wheat and other grain, for an offering. On the first day after they had offered sacrifices to the above named deities at the Capitol, they returned to the Campus Martius, where they had assembled, and held sports to the honour of Apollo and Diana. On the second day, at the hour appointed by the oracle, the noble matrons went to the Capitol to sing hymns to Jupiter; and on the third day of the feast, twenty-seven boys, and as many girls, sung in the temple of Palatine Apollo hymns and verses in Greek and Latin, to recommend the city to the protection of those deities, whom they particularly honoured by their sacrifices.

Authors are not agreed as to the number of years in which these games returned; partly because the quality of an age or seculum, among the ancients, is not known; and partly on other accounts; some will have it, that they were held once every hundred years; and that the *seculum*, or age, was our century. This Varro and Livy seem to express in very plain terms; yet others will have it, that seculum comprehended a hundred and ten years; and that the secular games only returned in that period, that is, at the beginning of every 111th year; which opinion is countenanced by Horace, in his *Secular Poem*, ver. 21.

Be this as it will, it is certain they sometimes did not stay for the 111th, nor even for the 100th year, for the celebration of these games. The first were held A. U. C. 245, or 298; the second, A. 305, or 408; the third, A. 518; the fourth, either A. 605, or 608, or 628. Augustus held them in the year of Rome 736, and Claudius again in the year of Rome 800, and of Christ 38, *viz.* sixty-four years after the former; and Domitian, again, in still less time; *viz.* in the year of Rome 841, or of Christ 79, at which Tacitus ascribed in quality of quindecimvir, as he himself tells us, *Annal.* lib. xi. cap. 11. and this was the seventh time that Rome had seen them from their first institution. The

VOL. XXXII.

emperor Severus exhibited them the eighth time, that is, a hundred and ten years after those of Domitian. Zosimus says, these were the last; but he is mistaken, for in the year of Rome 1000, that is, fifty years after those of Severus, the emperor Philip had them celebrated with greater magnificence than had ever been known. Those that were celebrated by permission of the emperor Honorius, after having received the news of the victory of Stilicon over Alaric, were the last recorded in history. Zosimus ascribes the decline of the empire to the neglect of these games among the Romans. We find them represented on many medals.

SECULAR Poem. See *SECULARE carmen*.

SECULAR Year, the same with jubilee.

SECULARE CARMEN, *Secular poem*, a poem sung, or rehearsed, at the secular games.

Of this kind we have a very fine piece among the works of Horace; it is a sapphic ode, which usually comes at the end of his epodes. In some editions, the twenty-first ode of the first book is also called "*Carmen Seculare*."

SECULARIZATION, the action of secularizing, or of converting a regular person, place, or benefice, into a secular one.

Almost all the cathedral churches were anciently regular, *i. e.* the canons were to be religious, but they have been since secularized.

For the secularization of a regular church there is required the authority of the pope, that of the prince, the bishop of the place, the patron, and even the consent of the people. And in France all this must be confirmed by parliament.

Religious that want to be released from their vows, obtain briefs of secularization from the pope.

SECULUM, in *Antiquity*. See *AGE* and *SECULAR Games*.

SECUNDA AQUA, among *Chemists*, &c. See *AQUA Secunda*.

SECUNDA super operatione pasturae. See *SURCHARGE*.

SECUNDANI, in *Ancient Geography*, a people of Gaul, who inhabited the town of Arausio, situated in the interior of the country.

SECUNDANS, in *Mathematics*, an infinite series of numbers, beginning from nothing, and proceeding as the squares of numbers in arithmetical progression, as 0, 1, 4, 9, 16, 25, 36, 49, 64, &c.

SECUNDARAH, in *Geography*, a town of Hindoostan, in the subah of Delhi; 28 miles S.E. of Delhi. N. lat. 28° 22'. E. long. 78° 7'.

SECUNDARY, or *SECONDARY*. See *SECONDARY*.

SECUNDERPOUR, in *Geography*, a town of Hindoostan, in Benares, on the Dewah; 35 miles E.N.E. of Gazypour.—Also, a town of Hindoostan, in the circar of Jyenagur; 15 miles S.E. of Parasaoli.

SECUNDI GENERIS, in *Anatomy*, a distinction among the lacteal vessels. There are two kinds of lacteals; *viz.* *primary*, or those of the first kind, *primi generis*; and *secundi generis*, *secondary*, or of the second kind.

The first carry the chyle from the intestines into glands dispersed in great numbers throughout the mesentery.

The second carry it from these glands, after its being diluted there with lymph, into the common receptacle. See *LACTEALS*.

SECUNDI internodii pollicis extensor. See *EXTENSOR*.

SECUNDIANS, in *Ecclesiastical History*, a sect of Valentinians in the second century, whose chief, Secundus, one of the principal followers of Valentine, maintained the doctrine of two eternal principles, *viz.* light and darkness, from

Y

whence

whence arose the good and the evil that are observable in the universe.

SECUNDINES, in *Anatomy* and *Midwifery*, the placenta, umbilical cord, and membranes including the fœtus, which, being expelled from the uterus after the fœtus, constitute the *after-birth*. They are described under the article **EMBRYO**.

Dr. Grew, in his *Anatomy of Plants*, applies the term fecundine to the fourth and last coat or cover of seeds; because this performs nearly the same office in plants, that the membranes, investing the fœtus, do in animals. And indeed Pliny, Columella, Apuleius, &c. have used fecundine in the same sense.

SECUNDO. *Propositio de SECUNDO adjacente*. See **PROPOSITION**.

SECUNDRA, in *Geography*, a town of Hindoostan, in the circar of Sirhind; 90 miles E. of Sirhind.—Also, a town of Hindoostan, in Dooab; 15 miles W. of Canoge.

SECUNDUS, JOHANNES, in *Biography*, is the literary name of John Everard, a celebrated Latin poet, the son of Nicholas Everard, an eminent jurist, and president of the council of Mecklin under Charles V. He was born at the Hague in 1511, and at an early age studied the law at Bourges. He, however, shewed a decided attachment to polite literature in preference to jurisprudence, and contracted intimacies with some of the most distinguished Latin poets of his time. He travelled into Italy and Spain, and was made secretary to cardinal Tavera, archbishop of Toledo. He followed Charles V. in his expedition against Tunis, but the delicacy of his constitution not permitting him to undergo the fatigues of war, he returned to the Low Countries, where he died at the early age of twenty-five. Few modern Latin poets have possessed more facility and sweetness than Secundus. A volume of his elegies, epigrams, odes, and miscellaneous pieces, together with a narrative in prose of his different journies, was published. Of all his poetical works, the "*Basia*" have been the most popular, on account of their diction, and the delicate voluptuousness of their painting. They are still read, and new editions are frequently printed. Johannes had two brothers, who were also elegant Latin poets, known by the names of Nicolas Grudius, and Adrian Marius. They have united in an affectionate commemoration of their deceased brother, annexed to his poems. Secundus himself practised the art of engraving, and to his volume is prefixed a portrait of a female, with the following inscription: "*Vatis amatoris Julia sculpta manu.*"

SECUNDUS, in *Botany*, a term not very easy, in the technical sense of Linnæus, to translate. *One-ranked* may generally express its meaning. This term is applied to a *racemus*, or cluster, whose flowers are all turned to one side, as in *Pyrola secunda*, Engl. Bot. t. 517.

SECUNDUS Mallei, in *Anatomy*, a name given by Duverney, and some others, to one of the muscles of the ear. It is the internus auris of Cowper and others, and is most properly named by Albinus tensor tympani.

SECUNDUS Oculum Movens, a name given by Vesalius to that muscle of the eye, called by Riolanus and others superbus, and elevator oculi, and by Albinus the subductor, one of his four muscoli recti of the eye.

SECUNDUS Peroneus. See **PERONEUS**.

SECUNDUS Scalenus. See **SCALENUS**.

SECURIDACA, in *Botany*, so named by Jacquin from the shape of the pod, which greatly resembles a bill-hook, or hatchet, *Securis*.—Jacq. Amer. 197. Brown. Jam. 287. Linn. Gen. 365. Schreb. 482. Willd. Sp. Pl. v. 3. 898. Ait. Hort. Kew. v. 4. 247. Juss. 366. Lamarck Dict.

v. 7. 51. Illustr. t. 599, and t. 629.—Class and order, *Diadelphia Oandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, small, deciduous, of three, ovate, coloured leaves, the uppermost of which is opposite to the standard, the others accompany the keel. *Cor.* papilionaceous, of five petals: wings much spreading, very obtuse; standard of two leaves, oblong, straight, united to the keel at the base, reflexed at the tip; keel as long as the wings, nearly cylindrical, its border dilated, bearing a little, obtuse, plaited appendage. *Stam.* Filaments eight, combined at the bottom; anthers oblong, erect. *Pist.* Germen superior, ovate, terminating in an awl-shaped style; stigma flat, dilated, toothed at the tip. *Peric.* Legume ovate, of one cell, ending in a ligulate wing. *Seed* solitary, oblong.

Obs. In habit this genus is very nearly allied to *Polygala*, but it is polypetalous, and the fruit has only a single cell, resembling the capsules of *Banisteria*.

Ess. Ch. Calyx of three leaves. Corolla papilionaceous: the standard of two leaves within the wings. Legume ovate, of one cell and one seed, ending in a tongue-shaped wing.

1. *S. erecta*. Upright Shrubby Securidaca. Linn. Sp. Pl. 992. Willd. n. 1. Swartz Obs. 274. Jacq. Amer. t. 183. f. 39.—Stem erect. Leaves oblong.—Native of stony places in Martinico and St. Domingo, flowering in April.—An upright tree, rising to the height of twelve feet, furnished with a few, long, slender, erect branches. Leaves oblong. Flowers in long, purple clusters.

2. *S. volubilis*. Climbing Securidaca. Willd. n. 2. (*S. scandens*; Jacq. Amer. t. 183. f. 83. Spartium scandens, fructu cristato et alato, flore rubro; Plum. Ic. t. 247. f. 1.)—Stem twining. Leaves oblong, acute.—Native of South America, and the West Indies. Found in Jamaica by Browne, and at Carthagea by Jacquin.—A twining shrub, whose younger, leafy branches are changed into very strong tendrils. Leaves alternate, oblong, pointed, scarcely stalked. Flowers in loose, lateral clusters, red, scentless.

3. *S. virgata*. Wand-like Securidaca. Willd. n. 3. Swartz Prodr. 104. (Spartium alterum scandens, fructu alato, flore variegato; Plum. Ic. t. 144. f. 1.)—Stem twining. Leaves roundish, very obtuse.—Native of Jamaica and Hispaniola. Swartz is of opinion, that Browne's first species in his History of Jamaica, must be this, and not *S. erecta*, as Linnæus supposed. We know of no further description of this species than what is quoted above.

For *Securidaca* of Tournefort, Miller, and Gærtner, see **CORONILLA**.

SECURINEGA, so denominated by Commerçon, from *securis*, a hatchet, and *nego*, to deny, or refuse to yield; in allusion to the extreme hardness of the wood, called *Bois dur* by the French, in the Isle de Bourbon. Some also call it, according to Commerçon's manuscripts, *Bois de Têze*, and others *Quin-quin*. The English, who met with this tree in Otaheite, named it, from the appearance of the leaves, Otaheite Myrtle.—Juss. 388. Willd. Sp. Pl. v. 4. 761. Poiret in Lamarck Dict. v. 7. 631. Ait. Hort. Kew. v. 5. 383.—Class and order, *Dioecia Pentandria*; (or rather *Monadelphica*.) Nat. Ord. *Euphorbiæ*, Juss.

Gen. Ch. Male, *Cal.* Perianth of one leaf, in five deep segments. *Cor.* Petals none. Nectary an annular notched gland, surrounding the base of the stamens. *Stam.* Filaments five, awl-shaped, short, combined at the base; anthers oval, lobed, obtuse. *Pist.* imperfect.

Female, on a different tree, *Cal.* Perianth as in the male, inferior, permanent. *Cor.* Nectary as in the male, permanent. *Pist.* Germen superior, nearly globular, three-sided; styles

styles three, short, permanent; stigmas obtuse. *Peric.* Capsule three-lobed, three-celled. *Seeds* solitary?

Eff. Ch. Male, Calyx in five deep segments. Petals none. Nectary a glandular ring on the outside of the stamens.

Female, Calyx and nectary as in the male, permanent. Capsule superior, three-lobed, three-celled.

1. *S. nitida*. Otaheite Myrtle. Willd. n. 1. "Perf. Syn. v. 2. 617." Ait. n. 1. (*S. durissima*; Gmel. Syst. Nat. v. 2. 1008. Poiretia Lam. Dict. v. 7. 632.)—Native of the isles of Mauritius and Bourbon, as well as of Otaheite, where it was observed by the late Mr. Christopher Smith. Living plants were brought to Kew by admiral Bligh, in 1793. This is treated as a stove plant, flowering in spring and summer. In the Mauritius it is a tall tree, with alternate, round, minutely warty branches, and very hard yellowish wood. Leaves alternate, stalked, ovate, various in size and bluntness, from one to three inches long, and about one broad, entire, smooth, with one rib, and many fine interbranching veins. Flowers numerous, in dense, sessile, globular, axillary tufts. Commerſon describes six stamens, but we find only five, according to the general observation of the authors above quoted.

SECURIS, JOHN, in *Biography*, an English physician of considerable character in his day, was born in Wiltshire, and studied with great reputation in New college, Oxford, in the reign of Edward VI. From thence he went to Paris, where he diligently pursued the study of astronomy and medicine, the latter under the celebrated professor Silvius. On his return, he settled at Salisbury, and was much resorted to on account of his skill in the practice of physic. He published annual tracts, which he called "Prognosticons;" and which appear to have been a kind of almanacs, accompanied with astronomical predictions and medical precepts. Anthony Wood had seen two of them, for the years 1579 and 1580. To the latter was added, "A Compendium, or brief Instructions how to keep a moderate Diet." Securis was likewise the author of "A Detection and Querimony of the daily Enormities and Abuses committed in Physic, concerning the Three Parts thereof." Lond. 1566. This is a little treatise, written with learning and plausibility, on the often repeated complaint of the intrusion of irregularly educated persons into the practice of physic, and the presumption of surgeons and apothecaries in taking upon them to act the physician. A peroration in verse, addressed to the two universities, is subjoined. This work was thought to have so much merit, that it was reprinted in 1662, and published along with Recorde's "Judicial of Urines." The author is not named in the title-page, but is called "A Doctor of Physick in Queen Elizabeth's Days." In this tract there is a reference to one which Securis had published about the year 1554, with this odd title; "A great Galley lately come into England out of Terra Nova, laden with Physicians, Surgeons, and Pothecaries." See Aikin's Biograph. Memoirs of Med.

SECURITATE PACIS, in *Law*, a writ which lies for one who is threatened with death or danger, against the person who so threatens him. It is taken out of chancery, directed to the sheriff. See PEACE and SURETY.

SECURITATEM *inveniendi quod se non divertat ad partes externas sine licentia regis*, an ancient writ lying for the king against any of his subjects, to stay them from going out of this kingdom into foreign parts; the ground whereof is, that every man is bound to serve and defend the commonwealth, as the king shall think fit.

SECURUM, *Si te fuerit*. See SI *te fuerit*.

SECUTOR, among the Romans, most commonly signified an attendant upon great men.

SECUTORES, in *Antiquity*, a kind of gladiators among the Romans, who fought against the retiarii.

The word is formed from the verb *sequi*, to follow; because the secutores used to pursue the retiarii, when they failed to cast the net, and fled to put in order.

The secutores were armed with a sword and a buckler, to keep off the net, or noose, of their antagonists; and they wore a cask on their head. Some confounded the secutores with myrmillones, because both had nearly the same weapons.

SECUTORES was also the name given to such gladiators as took the place of those killed in the combat; or who fought the conqueror. The post was usually taken by lot. In ancient inscriptions we also meet with *secutor tribuni*, *secutor ducis*, *secutor Caesaris*, &c. who were officers attending the tribunes and generals; perhaps like our aids-de-camp.

SECZENIAGA, in *Geography*, a town of European Turkey, in Dobruza Tartary, on the Danube; 20 miles N. of Kirfova.

SEDA, a town of Portugal, in Alentejo; 6 miles W. of Alter do Chao.

SEDAB, in *Botany*, a name given by the Arabian physicians to the wild, or mountain rue, a plant common in Syria, Greece, and other places. Avicenna supposes the gum, which he calls *gentum*, or *jentum*, to be produced from this plant, but very erroneously, that gum being obtained from the roots of the thapsia, or deadly carrot.

SEDAINE, MICHEL JEAN, in *Biography*, a French dramatic writer, was born at Paris in 1719. His father, an architect, having left his family entirely destitute, the subject of this article was obliged to work as a common mason, to maintain his mother and two younger brothers. By his laudable industry he became a master mason, but his fondness for the theatre having led him to make some attempts at dramatic composition, which were attended with a considerable portion of success, he was, in 1754, engaged by Monet, director of the comic-opera, to devote himself to the service of the stage. His talents were so well exerted, that he brought full audiences to that theatre, which had, before his time, been nearly deserted, and he passed many years in this employment, generally beloved and esteemed by the literary characters of the time. He died in the year 1797, in the 78th year of his age. Sedaine was the author of a great number of pieces, chiefly of the light kind, and accompanied by music. Some of them were eminently successful: the "Le Deferteur" was represented one hundred times. He had a perfect knowledge of stage effect: his dialogue was easy and natural, though extremely incorrect; hence his works were more adapted to the stage than to the closet.

SEDAKI, in *Geography*, a town of Japan, in the island of Nippon; 40 miles N.W. of Nambu.

SEDAN, a town of France, and principal place of a district, in the department of the Ardennes, situated on the Meuse; strongly fortified, and reckoned one of the keys of France. It is divided into the north and south parts: the former contains 5984, and its canton 11,471 inhabitants, in 14 communes: the latter has 4560, and its canton 13,124 inhabitants, in 22 communes. Both comprehend 320 kilometres. This town has a manufacture of cloth; and before the revocation of the edict of Nantes, it had a flourishing Protestant university; 13½ posts S.S.W. of Liege. N. lat. 49° 42'. E. long. 5° 0'.

SEDAN Chair. See CHAIR.

SEDANG, in *Geography*, a town on the N.W. coast of the island of Borneo. N. lat. $2^{\circ} 15'$. E. long. $110^{\circ} 48'$.

SEDAREE, a town of Persian Armenia; 30 miles S.E. of Erivan.

SEDASHYGUR, a town of Hindoostan, in Canara, on the coast; 6 miles N.W. of Carwar.

SEDASIER, a town of Hindoostan, in the country of Coorga, where a battle was fought in 1799, between the troops of Tippoo Sultan, and the British under general Stuart, in which the former were defeated; 7 miles from Periapatam.

SEDATIVE, in *Medicine*, from *sedare*, to still, or allay, a term which was used by the older writers, nearly in the same acceptation with *anodyne*; namely, to denote such medicines as were calculated to allay pain. But among the moderns it has been employed in another sense, and stands in opposition to *stimulant*. In the modern pathology, all the actions of the animal frame are ascribed to the agency of the nervous power; and whatever increases or excites that power, or its actions, is thence called a *stimulant*; and those agents, on the contrary, which diminish or restrain that power, or its actions, are therefore denominated *sedatives*. Of the former class, wine, alcohol, camphor, æther, aromatic substances, &c. may be enumerated as examples; of the latter, tobacco, digitalis, sugar of lead, opium, &c. In the school of Brown, however, where the word stimulant is in constant use, the existence of a direct sedative is absolutely denied; for the Brunonian hypothesis maintains, "that life is the result of the action of stimulants on the principle of excitability, and, consequently, that every thing which acts must be stimulant." (See *EXCITABILITY*.) It farther maintains, that a sedative action is not real, but apparent; or rather, is not direct, but indirect; that is, it is the result of the previous stimulation; and therefore, that an actual sedative is a non-entity. But this argument, like many others of the Brunonian school, is an obvious *petitio principii* in logic: it is founded upon two unproved propositions; first, that life is solely the result of excitement; and, secondly, that a previous excitement occurs, where it is not cognizable, as in the case of digitalis, and the superacetate of lead, and some other narcotics, which appear to influence directly the action of the heart and arteries, and to depress the whole nervous power. The use of *sedatives* for medicinal purposes, is principally confined to the regulation of the arterial system, as in cases of hæmorrhage, especially from the lungs, in diseases of the heart, &c.

SEDATIVUM SAL. See *Sedative SALT*.

SEDAU, in *Geography*. See *SEYDA*.

SEDBERGH, a market-town in the west division of the wapentake of Staincliffe and Ewecrofs, West Riding and county of York, England, is situated in the parish of Sedbergh, at the distance of 27 miles N.W. by N. from Settle, and 27 miles N.W. by N. from London. This place, which, according to the late population returns, contained 344 houses and 1805 inhabitants, is chiefly indebted for its support to the manufacture of iron articles. The market is held on Wednesday, weekly; and there are fairs annually on the 20th of March, and the 29th of October. Here is a free school, but neither it nor the church is in any way remarkable. *Beauties of England and Wales*, vol. xvi. by John Bigland, 8vo. 1813.

SEDE, a lake of Egypt, separated from the Mediterranean by a neck of land, which extends from Aboukir to within a mile or two of Alexandria. It communicates with the sea by a narrow opening, and westerly the British army opened a channel to form a communication with lake

Mareotis: it is also called the "lake of Aboukir."—Also, a lake of Egypt, producing natron; 55 miles N.W. of Cairo.

SEDEANA, a town of Italy, in Friuli; 10 miles W.S.W. of Udina.

SEDEFE', a town of Egypt, on the left bank of the Nile; 7 miles S. of Abutigé.

SE DEFENDENDO, in *Law*, a plea for him who is charged with the death of another; alleging, that he was forced to do what he did in his own defence, the other so assaulting him, that had he not done as he did, he must have been in danger of his own life. See *SELF-DEFENCE*, *HOMICIDE*, and *MANSLAUGHTER*.

SEDELLA, in *Geography*, a town of Spain, in the province of Grenada; 12 miles N. of Velez Malaga.

SEDEM ATTOLLENS, in *Anatomy*, a name given by Vesalius and others to the muscle, now more generally known by the name of levator ani.

SEDENTARIUM OS, a name given by some anatomical writers to the protuberance of the os coxendicis, on which the whole weight of the body rests in sitting.

SEDER OLAM, in *Philology*, a Hebrew term, literally signifying, *order of the world*; being the title of two chronicles in that language.

They are both very short, though the one more so than the other; for which reason the one is called *seder olam rabba*, that is, the *great seder olam*; and the other, *seder olam zuta*, i. e. *little seder olam*.

SEDER OLAM, the *Great*, commences at the creation of the world, and comes down as low as the war of the pseudo-messiah Barchochebas, under Adrian, fifty-two years after the destruction of the temple of Jerusalem; and of consequence to the hundred and twenty-second year of Christ. It is almost all taken from the Scripture, excepting the end. It is the work of R. Josa, son of Hhelfeta of Tisippora, who lived in the second century, about the year 130, and was master of the famous R. Juda Hakkadofsch, the compiler of the Mischna.

SEDER OLAM, the *Lesser*, is an abridgment of the former, brought down as far as Mar Sutra, who lived 450 years after the destruction of the temple, or 522 years after Christ. F. Morin, continually bent upon diminishing the antiquity of the principal books of the Jews, endeavours to prove this to have been written about the year of Christ 1124, as indeed it is expressed in the beginning; but R. Dav. Gantz has overthrown this opinion in his Tsemabh David, and shewn that the date in the beginning is an interpolation.

These two chronicles were first printed at Mantua in 1514, 4to.; again at Basil, by Frobenius, in 1580, 8vo.; at Venice, in 1545, 4to.; and at Paris, with a Latin version of Genebrard, in 12mo. They have been since reprinted at Amsterdam, in 1711.

SEDERON, in *Geography*, a town of France, in the department of the Drôme, and chief place of a canton, in the district of Nyons. The place contains 614, and the canton 7334 inhabitants, on a territory of 375 kilometres, in 18 communes.

SEDFE', a town of Egypt, on the left bank of the Nile; 3 miles S. of Bata.

SEDE GRASSES, in *Agriculture*, a title given to various sorts of grasses of the poor hard carnation kind, which are very hardy in their nature, and prevail much in most crude heavy land. They are scarcely ever touched by live-stock, being what may be called the fag end of herbage. See *CAREX* and *WEEDS*.

SEDGEFIELD, in *Geography*, a market-town in the north-east division of Stockton ward, county palatine of Durham, England, is situated at the distance of 11 miles S.E. by E. from Durlam, and 255 N. by W. from London. The position of this town is one of the finest that can be imagined, being that of the summit of a gentle swell, surrounded on all sides by a country in the highest state of cultivation. On the south and south-east is a delightful prospect of Cleveland, Roseberry-Topping, and a long range of lofty hills, with the borders of the river Tees, down to the German ocean; on the south-west is a beautiful country decked with a variety of fine seats; and on the north and north-east appear the towns of Bishop Middleham, and Fishburn and Trimdon. The celebrated Dr. Askeu called Sedgefield the Montpelier of the north of England, and very frequently recommended his patients to it for the benefit of the air. In the centre of the town is a spacious market-place ornamented with a handsome cross. On one side of it stands the church, which consists of a nave, transept, chancel, and three aisles, with a lofty tower rising from the intersection of the nave and transept. The pillars of the interior are clustered, and support light pointed arches. Between the nave and the chancel is a rich screen of tabernacle work in oak, having three stalls on each side, divided by beautiful light columns, and covered with canopies. The whole chancel is wainscotted with oak, panelled, and ornamented with cherubs. In this church were formerly two chantries, one dedicated to St. Catharine, and the other to St. Thomas; also a guild, dedicated to St. Mary. Here are numerous monuments; and among others two curious brasses, representing skeleton figures in winding sheets.

Sedgefield became a market and fair-town in 1312, by grant from bishop Kellawe. The market-day is Friday, weekly; and the fair is held on the eve of St. Edmund. Here is an hospital, founded by the trustees of Thomas Cooper, surgeon of this place, who died in 1703; also a free grammar-school, situated near the church. According to the parliamentary returns of 1811, this town contained 291 houses, and a population of 1307 inhabitants. The History and Antiquities of the County Palatine of Durham, by William Hutchinson, F.A.S. vol. iii. 4to. 1794.

SEDDER RIVER, a river of Patagonia, which runs into the Straits of Magellan. Its water is excellent, and on each side are very fine trees, which commodore Byron says, would supply the British navy with the best masts in the world: some of them being of a great height, and more than eight feet in diameter. Among these woods are many parrots, and other birds of most beautiful plumage. Geese, ducks, and fish, and fresh provisions are abundant. The traces of wild beasts were perceived in the sand, but none were seen. Many huts and wigwams were seen, but no Indian was observed. The mouth of this river is in the W. part of Port Famine.

SEDDMOOR, a large tract of English land, in the county of Somerset, memorable for the defeat of the duke of Monmouth in the year 1685; situated between Somerton and Bridgewater.

SEDDWARA, a town of Hindoostan, in Guzerat; 20 miles E. of Surat.

SEDDWICK, a town of America, in the state of Maine and county of Hancock, on Naskeag Point, which bounds Penobscot on the N.E., extending to the town of Penobscot, and distant 315 miles E. from Bolton. It contains 1352 inhabitants.

SEDHOUT, a town of Hindoostan, in the circar of Cuddapa; 6 miles N.E. of Cuddapa.

SEDILO, a town of the island of Sardinia; 30 miles N.E. of Oristagni.

SEDIMENT, formed from the Latin *sedimentum*, which Matthias Sylvaticus derives a *diuturna fede*, the settlement or dregs of any thing; or that gross, heavy part of a fluid body which, upon resting, sinks to the bottom of the vessel.

Some physicians have found means to discover much of the nature of the disease, from the sediment of the urine. Dr. Woodward maintains, that, at the deluge, the whole terrestrial globe was dissolved into one uniform mass; and that the new world, arising thence, was perfectly spherical, and without any inequalities, consisting of several strata, which the earthy sediment gradually produced, as it drained.

SEDINA, in the *Materia Medica*, a word used by some writers to express dragon's blood.

SEDINI, in *Geography*, a town of the island of Sardinia; 10 miles S.E. of Castell Aragonese.

SEDITION, among *Civilians*, is used for an irregular commotion of the people, or an assembly of a number of citizens without lawful authority, tending to disturb the peace and order of society. See **REBELLION**.

This offence is of different kinds: some seditions more immediately threatening the supreme power, and the subversion of the present constitution of the state; others tending only towards the redress of private grievances. Among the Romans, therefore, it was variously punished, according as its end and tendency threatened greater mischief. (See lib. i. Cod. de Seditiosis, and Matth. de Crimin. lib. ii. n. 5. de Læsa Majestate.) In the punishment, the authors and ringleaders were justly distinguished from those, who, with less wicked intention, joined and made part of the multitude.

The same distinction holds in the law of England, and in that of Scotland. Some kinds of sedition in England amount to high treason, and come within the stat. 25 Edward III. as levying war against the king. And several seditions are mentioned in the Scottish acts of parliament as treasonable. (Bayne's Crim. Law of Scotland, p. 33, 34.) The law of Scotland makes riotous and tumultuous assemblies a species of sedition. But the law there, as well as in England, is now chiefly regulated by the riot act made 1 Geo. I.; only it is to be observed, that the proper officers in Scotland to make the proclamation thereby enacted, are sheriffs, stewards, and bailies of regalities, or their deputies; magistrates of royal boroughs, and all other inferior judges and magistrates; high and petty constables, or other officers of the peace, in any county, stewartry, city, or town. And in that part of the island the punishment of the offence is death, and confiscation of moveables: in England it is felony. See **RIOT**.

SEDDLEY, *Sir CHARLES*, in *Biography*, a dramatic writer, born in 1639, was son of sir John Sedley of Ayleford, in Kent. He was educated at Wadham college, Oxford, and after leaving the university, he passed his time in retirement till the restoration. On that event he came to court, and was one of the licentious circle round Charles II. His first essays in writing were some amatory poems, chiefly distinguished by their voluptuous cast. At this period of his life he was guilty of some public indecency, on account of which he was fined 500*l*. Sir Charles's fortune being impaired by this course of life, he got into the house of commons, and he sat in three parliaments during that reign, in which he was frequently speaker. In the following reign he took a patriotic part, which would have been highly to his credit, if private pique

had

had not been the principal motive of his conduct. It appears, notwithstanding the laxity of his own morals, that he was much offended with James II. for taking his daughter for a mistress, in which quality she was raised to the title of countess of Dorchester, an elevation that, as her father indignantly said, only rendered her infamy the more conspicuous. Sir Charles joined the earl of Dorset in a steady opposition to the design of keeping up a standing army after Monmouth's rebellion, and he concurred in all the measures which produced the revolution. For the latter he gave the numerous reason, that as the king had made his daughter a countess, he would in return do all in his power to make his majesty's daughter a queen.

Sedley long continued to be regarded as a fine gentleman, a lively companion, and a judge and patron of poetry, in which last capacity he was instrumental in bringing Charles Montague, afterwards earl of Halifax, into notice. He is supposed to have lived to beyond his eightieth year. His works, in two vols. 8vo., consist of poems, speeches in parliament, and a number of dramatic pieces, none of which are retained on the stage. *Biog. Brit.*

SEDLÉZANY, in *Geography*. See SELTSCHAN.

SEDLITZ, or GREAT SEDLITZ, a town of Saxony, in the margravate of Meissen; 2 miles S.W. of Pirna.—Also, a village of Bohemia, in the circle of Saatz, where Hoffmann, in the year 1724, discovered a medicinal spring, from which is prepared a purgative salt, near Most.

SEDMA, a word used by some as a name for the *lapis hematites*.

SEDNEVO, in *Geography*, a town of Russia, in the government of Tchernigov; 24 miles N.E. of Tchernigov.

SEDORP, a town of the duchy of Holstein; 8 miles N.E. of Segeborg.

SEDOSA, a town of the island of Corsica; 12 miles N.W. of Corte.

SEDOSCHEROI, in *Ancient Geography*, a people of Pontus, in the vicinity of the river Cihibus, according to Tacitus.

SEDR, or SEDRE, the high priest of the sect of Ali, among the Persians.

The fedr is appointed by the emperor of Persia, who usually confers the dignity on his nearest relation.

The jurisdiction of the fedr extends over all effects destined for pious purposes, over all mosques, hospitals, colleges, sepulchres, and monasteries. He disposes of all ecclesiastical employments, and nominates all the superiors of religious houses. His decisions, in matters of religion, are received as so many infallible oracles; he judges of all criminal matters, in his own house, without appeal; and is, without contradiction, the second person in the empire.

The fedr, however, has not any indelible character, but frequently quits his post for another purely secular one. His authority is balanced by that of the mudsitchid, or first theologian of the empire.

SEDRE PASSAGE, in *Geography*, a narrow channel of the East Indian sea, on the N. coast of Sumatra, between Pulo Nancy and King's Point.

SEDULIUS, CAIUS CÆLIUS, or CÆCILIUS, in *Biography*, a priest and poet, who flourished about the year 430. He is known only by his writings, of which the principal is a Latin poem in heroic verse, entitled "Paschale Carmen," in five books, the first of which relates to the histories recorded in the Old Testament, and the last four to the life and miracles of Christ. This work is chiefly esteemed for its subject, though the style is flowing, and, for the age in which it was written, is tolerably pure. It has been printed several times, and is contained in Mattaire's

"Corpus Poetarum." An edition of it was printed in 1704. A prose work of the same writer is extant, entitled "Paschale Opus."

SEDUM, in *Botany*, an ancient generic name used by Pliny, derived from *sedere*, to sit; on account of its sitting or growing in the clefts, or on the surface of rocks. The application of the name, however, is somewhat obscure.—Linn. Gen. 230. Schreb. 309. Willd. Sp. Pl. v. 2. 760. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 485. Prodr. Fl. Græc. Sibth. v. 1. 308. Ait. Hort. Kew. v. 3. 111. Pursh v. 1. 282. Tournef. t. 140. Juss. 307. Lamarck Illustr. t. 390. Gærtn. t. 65.—Class and order, *Decandria Pentagynia*. Nat. Ord. *Succulentæ*, Linn. *Sempervivæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, five-cleft, acute, erect, permanent. *Cor.* Petals five, lanceolate, pointed, flat, spreading. Nectary composed of five, very small, emarginate scales, inserted at the base of the germens. *Stam.* Filaments ten, awl-shaped, the length of the corolla; anthers roundish. *Pist.* Germens five, superior, oblong, each terminating in a slender style; stigmas obtuse. *Peric.* Capsules five, spreading, pointed, compressed, emarginate towards the base, opening inwardly by a longitudinal future. *Seeds* numerous, very small.

Ess. Ch. *Calyx* five-cleft. Petals five, with five nectariferous scales at the base of the germen. Capsules five, superior.

The herbage of this genus is succulent, and mostly, though not invariably, smooth. The flowers are either of a yellow, white, or reddish colour.—Willdenow enumerates twenty-nine species, which are divided, after Linnæus, into two sections, *Planifolia* and *Teretifolia*; the former including such as have flat leaves, the latter such as have round, or cylindrical ones. To these however we have several to add, some of which are British. As a selection from the whole genus, the following are the most remarkable.

SECT. 1. *Planifolia*.—Leaves flattish.

S. *Telephium*. Orpine or Live-long. Linn. Sp. Pl. 616. Engl. Bot. t. 1319. Curt. Lond. fasc. 3. t. 25.—Leaves flattish, serrated. Corymbose. Stem erect. Found in dry fields, about hedges, and on bushy hills in Britain and most parts of Europe, on a gravelly or calcareous soil, flowering in August.—*Root* perennial, tuberous, fleshy, white. *Stems* two feet high, erect, simple, leafy, round, smooth, purplish. *Leaves* scattered, sessile, ovate, fleshy, flat, toothed in a serrate manner, rather glaucous, smooth. *Flowers* purple, occasionally white, forming terminal, many-flowered, crowded, leafy tufts. This species is found to vary in the colour of its flowers and the serrature of its leaves, as well as in the size of all its parts.

S. *Anacampteros*. Evergreen Orpine. Linn. Sp. Pl. 616. Curt. Mag. t. 118. (*Anacampteros minor*, rotundior folio, sempervirens; Tourn. Inst. 264.)—Leaves wedge-shaped, attenuated at the base, nearly sessile. Stems decumbent. Flowers corymbose.—Native of the south of France, mostly in the crevices of rocks. It flowers in July and August.—*Root* perennial, fibrous. *Stems* reddish, trailing at their base, more upright and glaucous towards the top. *Leaves* numerous, alternate, or scattered, ovate, fleshy, dotted at the tip, of a blueish-green colour. *Flowers* deep lilac or purple, rarely white, in compact, leafy, terminal tufts.

S. *populifolium*. Poplar-leaved Stone-crop. Linn. Suppl. 242. Willd. n. 7. Curt. Mag. t. 211.—Leaves flat, heart-shaped, toothed, on stalks. Corymbs terminal. Stem erect, slender.—Discovered by Pallas in Siberia, whence it was introduced at Kew, in 1780. It flowers in July and August.

SEDUM.

August.—*Root* slightly fibrous. *Stems* herbaceous, erect, a little wavy, spreading, about a foot in height, frequently of a bright red colour. *Leaves* alternate, remote, on longish stalks, slightly lobed, turning of a brownish-red colour, fleshy.

In habit and appearance, this plant greatly resembles *Saxifraga rotundifolia*.

S. stellatum. Starry Stone-crop. Linn. Sp. Pl. 617. "Fl. Græc. t. 446."—*Leaves* flattish, angulated. *Flowers* lateral, solitary, sessile.—Native of France, Italy, and the mountains of Crete, flowering in June and July. *Root* annual, with spreading fibres. *Stem* upright, thick, wavy, pink-coloured at the base, brownish at the top. *Leaves* scattered, wedge-shaped, angulated with about seven teeth, very fleshy, with pellucid dots, finely striated. *Flowers* solitary, terminal, of a delicate white colour; each petal marked longitudinally with a pink line.

S. Cepæa. Purslane-leaved Stone-crop. Linn. Sp. Pl. 617. "Fl. Græc. t. 447."—*Leaves* flat, lanceolate. *Stem* branched. *Flowers* panicled. *Petals* acute, tipped with an awn.—Native of most parts of the south of Europe, in fields and uncultivated ground, flowering in July and August. *Root* annual, fibrous. *Stems* procumbent, woody at the base, yellowish-green, much branched, thickly beset with hairs and red dots. *Leaves* alternate, remote, tongue-shaped, dotted like the stems. *Flowers* numerous, scattered over all the branches, in spreading panicles, of a white colour, striped with a pink rib.

S. tetraphyllum. Four-leaved Stone-crop. Sm. Prodr. Fl. Græc. Sibth. n. 1048. "Fl. Græc. t. 448."—*Leaves* in fours, spatulate, entire, obtuse.—Found by Dr. Sibthorp in Peloponnesus, and also in Sicily.—*Root* annual, fibrous, white. *Stem* upright, hairy, branched at the base; the branches rather decumbent. *Leaves* four together, numerous, sessile, club-shaped, fleshy, fringed with hairs. *Flowers* in long, terminal, leafy spikes, white, striped with a pink rib. The whole plant is of a yellowish-brown hue, dotted with red, and thickly beset with hairs.

S. eriocarpum. Hairy-fruited Stone-crop. Sm. Prodr. Fl. Græc. Sibth. n. 1049. "Fl. Græc. t. 449."—*Leaves* oblong, obtuse, smooth. *Stem* cymose. *Calyx* smooth. *Germens* hairy.—Found in dry situations, in Peloponnesus. *Root* annual, fibrous. *Stem* prostrate, branched, wavy, and twiggy, yellowish-green, dotted with red, smooth. *Leaves* alternate, somewhat remote, coloured and dotted like the stems. *Flowers* solitary, of a beautiful pink colour, forming a sort of spike which terminates each of the branches.

Seçt. 2. *Teretifolia*.—*Leaves* somewhat cylindrical.

S. dasphyllum. Thick-leaved Stone-crop. Linn. Sp. Pl. 618. Engl. Bot. t. 656. Curt. Lond. fasc. 3. t. 26.—*Leaves* opposite, ovate, obtuse, fleshy. *Stem* weak. *Panicle* glutinous.—Found on walls or rocks in many parts of Britain, and if introduced into a garden, it propagates itself freely upon artificial rocks and garden pots; flowering copiously in June. *Root* apparently biennial, white and fibrous. *Stems* decumbent, creeping, branched, tufted, thread-shaped, a little viscid, leafy; flowering branches erect. *Leaves* mostly opposite, imbricated, gibbous, very succulent, entire, glaucous, tipped with red. *Flowers* three or four together, white with a purple streak, forming small, spreading panicles.

S. anglicum. English Stone-crop. Sm. Fl. Brit. 486. Engl. Bot. t. 171.—*Leaves* thick, ovate, gibbous, and loose at the base, alternate. *Cyme* of two branches.—Native of Great Britain, but not a common plant. It has been gathered near Dumbarton castle, on the sandy downs near Yarmouth, and other maritime and mountainous situa-

tions, flowering in July. *Root* annual, fibrous. *Stems* tufted, decumbent at the base, smooth, ruby-coloured, leafy. *Leaves* frequently alternate, or inclining to opposite, very thick, fleshy, obtuse, slightly glaucous, with a protuberance at their base. *Flowers* at first thickly clustered, afterwards more remote; the petals white, with a reddish rib, and generally dotted with red at the tip. *Capsules* membranous, smooth.

S. acre. Biting Stone-crop. Wall Pepper. Linn. Sp. Pl. 619. Engl. Bot. t. 839. Curt. Lond. fasc. 1. t. 32. Woodv. Suppl. t. 231.—*Leaves* alternate, somewhat ovate, fleshy, gibbous, fixed to the stem by their inner side above the base. *Cyme* three-cleft, leafy.—"This brilliant little flower is conspicuous enough about midsummer, and for some time afterwards, on walls, roofs, and dry barren or sandy ground, which it clothes as it were with a cloth of gold, in defiance of the drought and most scorching sun."—*Root* perennial, fibrous. *Stems* tufted, branched, decumbent, smooth, round, leafy. *Leaves* alternate, imbricated, erect-spreading, grass-green coloured, protuberant at the back. *Flowers* erect, golden-coloured, in terminal, solitary, three-cleft, leafy panicles.—"The whole herb is acrid, hot and biting to the taste, whence its common name Wall Pepper. Dr. Woodville quotes several authorities to prove its use in scorbutic and scrophulous disorders."

S. saxangulare. Insipid Stone-crop. Linn. Sp. Pl. 620. Engl. Bot. t. 1946. Curt. Lond. fasc. 4. t. 33.—*Leaves* in six or seven rows, somewhat cylindrical, obtuse, fleshy, spreading, fixed to the stem by their inner side above the base. *Cyme* three-cleft, leafy.—Occasionally to be met with in dry, sandy places, about walls, flowering in June and July.—In habit this perennial greatly resembles the last species, but it is generally rather larger. The leaves are more cylindrical, not ovate, about three together in alternate whorls, producing in the whole leafy stem or branch six or seven angles or rows. *Cymes* terminal, of two larger branches, and a small one. *Flowers* palish yellow. The foliage frequently turns red. The whole herb, though unpleasantly austere, is destitute of all acrid pungency of flavour.

S. saxatile. Mountain Stone-crop. Willd. n. 16. Wiggers Holiat. 35. "Fl. Græc. t. 450." Fl. Dan. t. 59?—*Leaves* scattered, convex on one side, flat on the other, obtuse, loose at the base. *Stem* branched, decumbent.—Native of rocky mountains in Norway and Switzerland, also in Greece, flowering about June.—*Root* annual. *Stems* woody, six inches high, branched, diffuse. *Leaves* slightly alternate, sessile, bright green, the lower ones sometimes turning red. *Flowers* sessile, solitary, standing on one side of the branches, yellow.

S. villosum. Hairy Stone-crop. Linn. Sp. Pl. 620. Engl. Bot. t. 394. Fl. Dan. t. 24.—*Stem* erect. *Leaves* flattish, slightly hairy, as well as the flower-stalks.—Native of mountainous damp pastures, and the moist fissures of rocks, flowering in July.—*Root* perennial, fibrous. *Stem* erect, leafy, downy towards the upper part, branched at the base. *Leaves* alternate, linear, fleshy, often pink-coloured, rough at the back with viscid hairs. *Flowers* cymose or panicled, on viscid stalks; their petals white or rose-coloured, with a red rib. *Capsules* pointed, rough, purplish.

S. album. White Stone-crop. Linn. Sp. Pl. 619. Engl. Bot. t. 1578. Curt. Lond. fasc. 1. t. 31. Fl. Dan. t. 66.—*Leaves* oblong, cylindrical, obtuse, spreading, smooth. *Panicle* much branched.—Found on rocks, walls, and roofs in many parts of England, but not a common plant. It flowers in July.—*Root* perennial, fibrous. *Stems* a span

SEDUM.

a span high, round, leafy, branched, smooth, decumbent at the base. *Leaves* scattered, spreading horizontally, rather glaucous, fleshy, and extremely juicy. *Panicle* terminal, rather cymose, many-flowered, smooth. *Flowers* white or reddish.

S. ochroleucum. Pale Stone-crop. Sm. Prodr. Fl. Græc. Sibth. n. 1058. Sm. in Transf. of Linn. Soc. v. 10. 6. (*Sempervivum fediforme*; Jacq. Hort. Vind. t. 81.)—*Leaves* glaucous, scattered, acute; the lower ones round; upper elliptical, depressed. Segments of the calyx rather acute.—Found on walls, stones, and banks, as well as about shady enclosures, in the south of Europe. It flowers in July. An interesting account of this species is given by sir J. E. Smith, in the volume of the Linnæan Transactions above quoted, where it is shewn to be the *Αειζων το μικρον* of Dioscorides, who describes it thus: "Several slender stems spring from one root, thickly encompassed with little, round, succulent, sharp-pointed leaves. It throws out, moreover, a stem towards the middle, about a span high, with an umbel of slender (greenish or) pale yellowish flowers."

This plant, when pounded, is used at Athens as a cooling cataplasm to bruises or to gouty limbs.

S. reflexum. Yellow Stone-crop. Linn. Sp. Pl. 618. Engl. Bot. t. 695.—*Leaves* awl-shaped, scattered, loosened at the base; the lowermost recurved. *Flowers* somewhat cymose.—Common on walls and thatched roofs, flowering in July. The roots are perennial, consisting of simple fibres. *Stems* round, leafy, spreading, entangled or pendant. *Leaves* scattered, extremely succulent, smooth, rather glaucous, often reddish, falling off when old. *Flowers* in a terminal cyme, bright yellow, numerous.

S. glaucum. Glaucous Stone-crop. Engl. Bot. t. 2477. (*S. reflexum* β; Sm. Fl. Brit. 490. *S. minus hæmatoides*; Ger. Em. 512.)—*Leaves* glaucous, awl-shaped, scattered, loosened at the base; those of the branches thread-shaped. *Flowers* in a cyme. Segments of the calyx lanceolate.—Native of this country, flowering in July and August. It differs from the last (of which it has till lately been considered but as a variety) in its more glaucous hue, and more slender leaves, especially those of the branches.

S. rupestre. Rock Stone-crop. Linn. Sp. Pl. 618. Engl. Bot. t. 170.—*Leaves* thick, awl-shaped, glaucous, erect, clustered together in a five-fold order, loose at the base. *Flowers* in a cyme.—Found occasionally on rocks and walls, but is rather a scarce plant. It flowers in July.—*Root* perennial, branched. *Stems* round, red, and naked at the lower part, branched, terminating in thick, club-shaped, tufts of closely imbricated, thick, and succulent leaves. *Flowering stems* upright, a foot high, clothed with more scattered leaves, and terminated by a large, handsome cyme of yellow flowers.

S. Forsterianum. Forsterian Stone-crop. Engl. Bot. t. 1802.—*Leaves* thick, awl-shaped, clustered together in many rows, spreading, loose at the base. *Flowers* in a cyme. Segments of the calyx short and rounded. Gathered by E. Forster, jun. esq. near the Devil's bridge, Cardiganshire, in 1806. It flowers in July. This species has hitherto been confounded with *rupestre*, from which however (says the author of English Botany) it differs "in having the leaves of the barren branches spreading in a rosaceous form, not close-pressed or erect, and especially in the want of a glaucous hue in the leaves, stem, and calyx. The petals also are more elliptical and blunt."

SEDUM, in Gardening, contains plants of the hardy herbaceous succulent kind, of which the species cultivated are; the orpine stone-crop (*S. telephium*); the evergreen

orpine (*S. anacamperos*); the yellow stone-crop (*S. aizoon*); the poplar-leaved stone-crop (*S. populifolium*); the starry stone-crop (*S. stellatum*); the purslane-leaved stone-crop (*S. cepæa*); the thick-leaved stone-crop (*S. dasphyllum*); the rock stone-crop (*S. rupestre*); the Spanish stone-crop (*S. hispanicum*); the white stone-crop (*S. album*); the biting stone-crop, or wall pepper (*S. acre*); the insipid stone-crop (*S. sexangulare*); the English or mild white stone-crop (*S. anglicum*); and the annual stone-crop (*S. annuum*).

In the first sort there are several varieties, as with purple flowers, with white flowers, with broad leaves, and the greater orpine.

In the sixth sort there is a variety which has the stem more erect, and the lower leaves in threes or fours, the next opposite, and the uppermost alternate.

The seventh sort, when introduced into a garden, propagates itself freely upon walls, in waste places, and about garden pots; and no plant is better adapted to the purpose of decorating rock-work, as it grows without any trouble, in any aspect, multiplying very much by young shoots, and always looks beautiful.

The ninth, as well as the preceding sort, are cultivated in Holland and Germany to mix with lettuces in fallads.

The eleventh sort is eaten by some as a pickle.

Method of Culture.—These plants are all raised without much difficulty, by proper care and attention to have the soil dry, and of the poor sandy kind.

Culture in the Orpine Sorts.—These may all be readily increased by planting cuttings, during the summer months, in light mould in a shady situation, or in pots placed in similar situations. The plants in the open ground, as well as those in pots, should be kept clean from weeds, and be watered frequently when the weather is dry. They may likewise be raised by parting the roots, and planting them in a similar manner in the spring or autumn. When the plants are once well established, they spread rapidly, and require little or no care.

These plants are sometimes cultivated for medicinal use.

Culture in the Stone-crop Kind.—These are raised without much trouble, by planting out their trailing stalks in the spring or summer season, which readily take root. They thrive most perfectly on old walls, buildings, or rock-works. Where cuttings or roots of the perennial kinds are planted in some soft mud, placed upon such situations, they quickly take root and spread into the different joints and crevices, covering the whole in a very short time.

The seeds of the annual sorts also, when sown soon after they become ripe in such situations, soon come up and support themselves without further trouble.

Most of the perennial sorts are kept in the nurseries in full plants, fit for setting out in the borders, pots, &c. either in the spring for flowering the same year, or in the autumn to flower in the following year. These plants may be planted out in any dryish light soil, in borders, beds, and other places, and in the sides of dry banks, or in any elevated rubbishy soil, as well as in pots to move to different parts occasionally; or also some of the evergreen kinds, to introduce in their pots among winter plants under shelter, to increase the variety. In most sorts, they may also be introduced as rock plants, to embellish artificial rock-works, ruins, and other similar places in pleasure-grounds. The stone-crops and other low trailing kinds may also be made to occupy the tops of any low walls, pent-houses, sheds, or other low buildings.

And further, the twelfth and thirteenth sorts may likewise

wife be disposed in patches towards the fronts of borders, &c. as they spread thick and tufty close to the ground, and flower abundantly; and being planted in pots, are proper to place on the outside of windows, copings of low walls, and in balconies, and court-yards, in assemblage with other low fancy plants; they will closely overspread the surface, and flower profusely as far as they extend in such situations.

SEDUM *Acre*, *Wall-stone Crop*, or *Wall-pepper*, in the *Materia Medica*, a common British plant, growing on houses, walls, and gravelly banks, is, in its recent state, extremely acrid, like the hydropiper; and, therefore, if taken in large doses, it acts powerfully on the primæ viæ, proving both emetic and cathartic; and applied to the skin, as a cataplasm, it frequently produces vesications and eruptions. Boerhaave, therefore, imagined that its internal employment must be unsafe; but experience has discovered, that a decoction of this plant is not only safe, but of great efficacy in scorbutic complaints: for which purpose, a handful of the herb is directed by Below, a Swedish physician, to be boiled in eight pints of beer till they are reduced to four; of which three or four ounces are to be taken every, or every other, morning. Milk has been found to answer this purpose better than beer. Not only ulcers, simply scorbutic, but those of a scrophulous and even cancerous tendency, have been cured by the use of this plant, of which Marquet relates several instances. He likewise found it useful as an external application in destroying fungous flesh, and in promoting a discharge in gangrenes and carbuncles. Another effect for which this plant has been esteemed, is that of stopping intermittent fevers. Woodv. Med. Bot.

SEDUM *Majus*. See **SEMPERVIVUM**.

SEDUNI, in *Ancient Geography*, a people of Gallia Narbonensis, in the vicinity of the Nantuates and Veragri, who jointly occupied the country that lies between the Allobroges and the higher Alps.

SEDUNOVA, in *Geography*, a town of Russia, in the government of Irkutsk, on the Lena; 12 miles N. of Or-lenga.

SEDUSII, in *Ancient Geography*, a people of Germany, who fought under Ariovistus against Cæsar.

SEDZISZOW, in *Geography*, a town of Poland, in the palatinate of Sandomirz; 35 miles S. of Sandomirz.

SEE-AMOL, a small island in the East Indian sea, near the east coast of Borneo. N. lat. 5° 27'. E. long. 118° 48'.

SEASSEE, a small island in the Sooloo Archipelago. N. lat. 5° 25'. E. long. 120° 50'.

SEEAXUR, a river of Hindoostan, which runs into the bay of Bengal, near Pondicherry.

SEEBACH, a town of Austria; 1 mile S.S.W. of St. Jorgen.—Also, a river of Saxony, which runs into the Muldau, 2 miles S. of Eulenburg.

SEE-BANGOG, a small island in the East Indian sea, near the east coast of Borneo. N. lat. 4° 18'. E. long. 118° 24'.

SEEBERGEN, a town of Germany, in the duchy of Gotha, in which is a celebrated observatory, erected by the late duke; 4 miles E.S.E. of Gotha.

SEEBGUNGE, a town of Hindoostan, in Bengal; 12 miles S. of Goragot.—Also, a town of Hindoostan, in Bengal, on the left bank of the Ganges; 5 miles N. of Boglipoor.—Also, a town of Bengal; 45 miles N.E. of Purneah.—Also, a town of Bengal; 40 miles N.N.E. of Nattore. N. lat. 25°. E. long. 89° 32'.

SEEBO, the largest river in West Barbary: it rises in a

piece of water situated in the midst of a forest, near the foot of Atlas, eastward of the cities of Fez (Fas) and Mequinez (Mequinas), and winding through the plains, passes within six miles of Fez. Another stream, proceeding from the south of Fez, passes through the city, and discharges itself into this river. This stream is so valuable to the inhabitants of Fez, as it supplies the town with water, that it is called "Wed El Juhor," the river of pearls, a term indicating its value. Some auxiliary streams, proceeding from the territory of Tezza, fall into the Seebo in Liali, or the period between the 20th of December and 30th of January inclusive. This river is impassable, except in boats, or on rafts. At Meheduma, or Mamora, where it enters the ocean, it is a large, deep, and navigable river; but the port being evacuated, foreign commerce is annihilated, and little shipping has been admitted since the Portuguese quitted the place. This river abounds more than any other in that rich and delicate fish called shebbel. If this country afforded any encouragement to industry, corn might be conveyed up the Seebo river to Fez at a very low charge; whereas it is now transported to that populous city by camels, the expence of the hire of which often exceeds the original cost of the grain. Jackson's Account of the Empire of Morocco.

SEEBPOUR, a town of Bengal; 12 miles N. of Hoogly.

SEEBURG, a town of Prussia, in the province of Ermeland; 55 miles S. of Königsberg. N. lat. 53° 31'. E. long. 20° 40'.—Also, a town of Westphalia, in the county of Mansfeld; 5 miles E. of Eifzleben. N. lat. 51° 31'. E. long. 11° 51'.

SEED, **JEREMIAH**, in *Biography*, a learned divine of the church of England, was born at Clifton, in Cumberland, and educated at Queen's college, Oxford, where he took his degrees in the arts, and obtained a fellowship. He was afterwards presented to the rectory of Enham, in Hampshire, where he died in 1747. His sermons, which are very highly esteemed, are published in 4 vols. 8vo.

SEED, *Semen*, in the *Animal Economy*. See **SEMEN** and **GENERATION**.

SEED, in *Botany*, is that most important organ in the fructification of vegetables, the perfecting of which is indeed the sole object of all the other parts: to this end they are subservient either in forming, perfecting, or dispersing it. A seed is composed of many essential parts. See **EMBRYO**, **COTYLEDONES**, **ALBUMEN**, **VITELLUS**, **TESTA**, **HILUM**.

Besides these, there are various accessory parts, or appendages, to seeds, which come under the following denominations. See **PELLICULA**, **ARILLUS**, **PAPPUS**, **CAUDA**, **ROSTRUM**. To these we must add **ALA**, which our predecessor has neglected to describe as a seminal appendage, in its proper article. (See that article.) The **ALA**, or *wing*, is a dilated membranous appendage to seeds, serving to waft them along in the air: it is commonly solitary, except in some umbelliferous plants. Seeds are occasionally furnished with spines, hooks, scales, crested appendages, particularly a little gland-like part sometimes called *Strophium*, and situated near the *Hilum*.

The various modes by which seeds are dispersed, in order to accomplish their germination, cannot fail to strike an observing mind with admiration. Indeed this is a most amusing branch of the science of vegetable economy. Sm. *Introd. to Bot.* ed. 3. 219—232.

SEEDS, *Echinate*. See **ECHINATE**.

SEEDS, *Naked*. See **NAKED**.

SEEDS, *Winged*. See **WINGED**.

SEED.

SEED-Down. See PAPPUS.

SEED-Vessel. See PERICARP.

SEED, in *Agriculture*, the grain or other product of a plant, whereby the species is propagated, upon its being sown or put into the earth.

It may be observed, that the choice of the seed intended to be sown, is an object of greater importance than many farmers seem to imagine. It is not sufficient that the finest grain be chosen for this purpose, unless it be likewise clear from weeds. In procuring seed, it should, therefore, be a rule with the farmer to purchase or reserve such as is the most full, plump, sound, clean, and healthy, whatever the sort may be; as it is perhaps only in this way that crops of really good corn can be ensured. And this practice is still more obvious, from the circumstance of its being in some measure the same with plants as with animals, that the produce is in a degree similar to that from which it originated. It is not, however, merely on this principle that such grain as is small, shrivelled up, and imperfectly fed, should be rejected as improper for seed, but as containing a smaller proportion of farinaceous matter, and being thereby less proper for affording that degree of nourishment which is necessary to the young plants, during the period of the first stage of their growth. Where shrivelled-up and imperfectly ripened seed is sown, in general but a little of it vegetates; and that which does, mostly sends forth plants of a weak and feeble kind, that afford only a lean and feeble sort of crop. Besides, there are other circumstances which ought to be taken into the account, in providing of seed corn; such as that it be new, and recently threshed from the straw, and that the skin be clear and thin; for it is found that grain which is fresh, and only just threshed out, is in a much more proper state for quick vegetation, than such as has been long kept, consequently less liable to perish in bad seasons; and that where the rind or skin is of a bright colour, and thin, a much larger proportion of fine farinaceous or mealy matter is yielded from the same quantity of grain, which renders it of course more valuable to the cultivator. This is particularly the case in wheat, and the same thing probably takes place in other sorts of corn.

And the writer of the Synopsis of Husbandry has shewn, by some experiments, that wheat, after being kept six or seven years, though there may not be any perceptible difference in its appearance from such as is new, is wholly unfit for being made use of as seed, on account of only a small portion of it being capable of vegetating; a circumstance that may probably, in many cases, be owing to the grain being more disposed, under such conditions, to take on the putrefactive fermentation, or become rotten, than to the absorption of oxygen, which is believed to be essential to the process of vegetation in the early stage, as stated by Mr. Gough in the *Manchester Transactions*; and besides this effect, where the moisture and juice of the grain is much taken away, as is the case in keeping it for a great length of time, the plants that are produced from it may even be less vigorous and luxuriant, as happens in gardening to some kinds of seeds, as that of the melon, which is frequently kept for several years, in order to effect this purpose in a more perfect manner.

On these accounts, therefore, it must be evident that, on such principles, grain, in order to secure perfect vegetation, should not be placed too much out of the influence of the atmospheric air; and that the bed of mould, or earth, in which it is deposited, be in as fine a powdery state as possible; as, under such circumstances, the air is more uniformly admitted, and the seed, from being in a more equal temperature, and more equally supplied with moisture, is

exposed in the most favourable circumstances to the combined effects of the causes that have been found to promote the sprouting, growth, and prosperity of the young corn plant, as has been fully shewn by Mr. Gough, in his excellent paper on the vegetation of seeds. And there should likewise be a constant attention, that no such grain as is in any way diseased should ever be made use of as seed corn; as the sowing of this sort of seed, though it may have been advised by some cultivators, who have not been sufficiently cautious, or who have placed too much confidence on the efficacy of *sleeps*, can only disappoint the views and hopes of the farmer, by propagating more widely such maladies, or producing scanty crops of good grain.

A great many different methods have been pursued, in the view of securing such grain as is healthy and proper for the purpose of sowing; but that which is the most readily executed is probably that of selecting from among the corn plants, while they are growing in the fields; as in this way an opportunity is afforded of choosing such heads or ears of the plants of different kinds as are the most perfect, the most forward, and most vigorous in their growth, and which contain such seeds as are the most plump, and full, and the best ripened. These benefits or advantages may likewise, in some measure, be attained in the most valuable sorts of grain, by having them picked over by hand, after being threshed out; but this is a tedious practice, and not so certain of having the seed from the most healthy and best ripened plants, as the above and some others: therefore, to have the most perfect sorts of seed, and at the same time the most healthy and proper for vegetation, the most vigorous plants should be selected, as well as such as are the most forward and early in respect to the season; and that these, while they are growing, be so preserved, that they may not be injured by having weaker plants of the same kinds near them; as the art of having good seeds does not, it is contended by an experienced farmer, depend so much upon obtaining new seeds from places at a considerable distance, as upon collecting and reserving the best seeds or roots of our own production. Dr. Priestley, in a paper in the first volume of *Communications to the Board of Agriculture*, has remarked that this method of practice has been had recourse to, in consequence of its having been found that though vegetables of all kinds are extremely liable to changes, in respect to the times of their maturation, or ripening, and other properties, the best seeds never fail to produce the best plants. It is likewise remarked, in addition, that in the preserving of seed grain, by collecting it in the ears from the stacks or sheaves, there may, however, be disadvantages in the way of lessening the produce, by choosing the largest ears, which have rarely more than one upon a stalk, and by taking such as become ripe at different periods.

It is observed that many different modes have been proposed for ascertaining the goodness of grain or seed-corn; but the farmer generally depends upon the appearances that it exhibits, preferring such as is full, plump, and well fed, and that has a certain brightness and clearness, without any shrivelling or shrinking in the husk or external covering. But it may perhaps be ascertained with greater accuracy by other means, as the weighing of a certain measure or quantity: and from its being well known that grain or seeds, on being immersed in fluids, leave the more light and imperfect floating on the surface, while the better and more perfect sink to the bottom; solutions well saturated with saline substances, from their gravity being much increased, become useful in ascertaining the goodness of the corns, as none but such as are perfectly sound sink in them. And the

the author of the *Philosophy of Gardening* conceives, that the weight of a given measure of grain may also be a tolerably certain method of discovering the quantity of husk or bran contained in it, compared with a quantity of flour: as that grain which is cut too early, or which is otherwise not quite ripe, as happens in wet seasons, shrinks in the barn or granary, and becomes wrinkled, and has thus a greater proportion of skin or bran than that which has been more perfectly ripened, and weighs lighter in proportion to its bulk. And another method, which he supposes may be had recourse to in order to distinguish light from heavy grain, is that of winnowing, as the surfaces of light grains, from their being greater in proportion to their solid contents, may be carried further by the current of air afforded in the operation; of course in passing them through a screen, the heavy grains may be liable to run further out on the floor from their being more propelled by their greater gravity, without the resistance of the air on their surfaces being increased, and be consequently more proper for seed-corn in general. See *CHANGE of Seed*.

But lately, however, a very different notion from the above has been entertained by sir Joseph Banks, though we do not find it supported by the test of experiment in the field. The result of a single trial, made under the circumstance of a hot-house, can never be satisfactory to the farmer. He thinks, that although the seeds of wheat may be rendered by the exhausting power of a fungus so lean and shrivelled, that scarcely any flour fit for the manufacture of bread can be obtained by grinding them, these very seeds will, except in the very worst cases, answer the purpose of seed-corn as well as the fairest and plumpest sample that can be obtained, and in some respects better; for as a bushel of much blighted corn will contain one-third at least more grains in number than a bushel of plump corn, three bushels of such corn will go as far in sowing land as four bushels of large grain. And that the use of the flour of corn in furthering the process of vegetation, is to nourish the minute plant from the time of its development till its roots are able to attract food from the manured earth; for this purpose one-tenth of the contents of a grain of good wheat is more than sufficient. The quantity of flour in wheat has been increased by culture and management calculated to improve its qualities for the benefit of mankind, in the same proportion as the pulp of apples and pears has been increased by the same means above what is found on the wildings and crabs in the hedges. Further, that though it is customary to set aside or to purchase for seed-corn the boldest and plumpest samples that can be obtained, that is, those that contain the most flour, this is unnecessary waste of human subsistence: the smallest grains, such as are sifted out before the wheat is carried to market, and either consumed in the farmer's family or given to his poultry, will be found by experience to answer the purpose of propagating the sort from whence they sprung as effectually as the largest. Every ear of wheat is composed of a number of cups placed alternately on each side of the straw; the lower ones contain, according to circumstances, three or four grains nearly equal in size; but towards the top of the ear, where the quantity of nutriment is diminished by the more ample supply of those cups that are nearer the root, the third or fourth grain in a cup is frequently defrauded of its proportion, and become shrivelled and small. These small grains, which are rejected by the miller because they do not contain flour enough for his purpose, have nevertheless an ample abundance for all the purposes of vegetation, and as fully partake of the sap (or blood, as we should call it in animals,) of the kind which produced them, as the fairest

and fullest grain that can be obtained from the bottoms of the lower cups by the wasteful process of beating the sheaves. But, however further and more numerous experiments may establish this doctrine, the best practice of the farmer is probably, at present, to take care to have good well-ripened grain, clear from all adulteration of seeds of the weed kind; without any blackness about the extremities of the grains, being free from that dark-brown colour that indicates its having been heated too much in the stack; and that it have no signs of mouldiness from being badly secured, or of shrinking from being cut in too green a state. It has also been lately suggested by Mr. Leori, who has been engaged in many interesting experiments on the subject, not by any means to procure seed grain from a soil north of that on which it is to be sown, but from a district south of it; as he considers it a general rule, that the product of seed improves in going from the south to the north, but decreases in virtue in passing from the north to the south.

And with respect to the proportion of seed that may be proper to be sown on different soils and situations, attention will not only be necessary to their peculiar nature, and to the periods of sowing or putting the seed into the ground, but also to the nature of the season, and the mode in which the sowing is executed in it. For crops in general, the strong, wet, and stiffer sorts of land will demand a larger quantity of seed than such as are more mellow, thin, and light; for coarse strong wet loams, and stiff retentive clays, must require more seed than light mellow loams, and sandy gravelly or even thin chalky lands. But where lands of the rich loamy kinds have been well reduced and broken down by the operations of tillage, it is observed, that if the seed be not sown in too great a proportion, an opportunity is afforded for the plants spreading themselves from the roots, many stems often issuing from the same root, in consequence of which the crops frequently become, even when thinly sown, extremely thick upon the ground; and from the great nutritive power of rich soils, or what is mostly termed strength by the farmers, would be greatly too much so, if a large proportion of seed were at first put in. And that in the case of root crops, whether such as are formed upon or within the soil, where such lands are in a sufficiently mellow and friable state for producing them, the seeds or sets should not on the same account be sown or put in in too great a quantity, or too thickly. While in the strong, stiff, wet, retentive soils, from the plants seldom striking, or branching off much from the roots, except in particularly favourable circumstances of season, a much greater proportion of seed will be necessary, in order to secure such full crops as lands of this kind are capable of supporting and bringing to maturity in most cases.

But where the soils are light and thin, a less quantity of seed will be sufficient, according to Mr. Donaldson and others; as, if a large proportion be put into such kinds of ground, from their possessing much less strength the crops will rarely, except in particular seasons, be well formed in the ear, or have the grain plump and well fed. It is likewise a practice in the best grain districts, on all sorts of land to sow smaller proportions of seed on lands of the same quality, in the early periods of the seed time, than in those of the latter. The reason of this, according to the above writer, is, that grain sown early in the season takes deeper root, and has more time to branch out additional shoots, than that which is later sown, which, when the soil is not very free as well as fertile, generally runs up into one single stalk, so that if a liberal quantity of seed be not allowed, the crop, however luxuriant in respect to the plants, must be scanty in the

SEED.

TABLE of Proportions of Seed on different Soils.

Kinds of Soil.	Wheat.		Barley.		Oats.		Beans.	
	Seed.	Crop.	Seed.	Crop.	Seed.	Crop.	Seed.	Crop.
	Bush.	Qrs.	Bush.	Qrs.	Bush.	Qrs.	Bush.	Qrs.
Rich, newly broken up common land.	—	5	—	—	—	10½	—	—
	—	—	—	—	—	9	—	—
	2½	4	—	—	6	7	—	—
	—	4½	—	—	—	8	—	4½
Middling land.	3	3½	3	5	5	6	4	3½
	3	2½	4	4½	7	5	—	—
	—	—	—	3	—	4	—	—
	3	—	4½	4	—	—	—	—
Newly inclosed land.	3	3	4	3½	5	4	—	—
	3	2¾	3	4	—	—	—	—
	2½	3	4	5	—	—	—	—
	2¼	3	4	4	4	5	3½	4
Wold land.	—	5	—	—	—	—	—	4
	2½	3	4	4	—	—	4	3
	4	—	—	—	—	—	—	—
	3½	4	4	4½	—	—	3	4½
Marsh land.	4	—	—	—	7	—	4	5
	—	—	—	—	—	10	—	—
	3	3	—	—	—	—	—	—
	3	5	4	6	—	7	—	5
Clay and marsh land.	3¾	2½	4	4	7	5	3	3
	—	—	4	5	—	—	4½	3
	2½	3	4	3	7½	4	4½	3½
	—	—	—	—	—	10	—	—
Strong land.	3	—	5	—	7	—	5	—
	3½	3	5	4	8	5½	—	—
	3½	4	4	5½	5½	7½	—	—
	—	3½	—	—	—	—	—	3
Average,	2½	3¼	—	—	5	7½	4	3½
	3½	2½	4	3¾	5	5	—	—
	2	3	2	4½	4	8	—	—
	3	3	4	3½	6	—	—	—
Average,	—	—	—	2½	—	4	—	—
	4	5	4	6	—	—	—	—
	3½	3	4	4½	6	5	—	—
	2½	3	4	4	6	5	—	—
Average,	3	3¾	3¾	4¾	—	—	2	4¾
	2½	3½	3	4½	6	6	—	—
	2¼	3¼	3	4½	6	5	2¾	4
	—	—	—	—	—	—	—	—

The exact proportion of seed that may be required, however, under different states and circumstances of lands, in order to afford the most full and productive crops, cannot by any means be ascertained, much constantly depending on the judgment of the seedman, who must always decide in respect to the necessary proportion for the particular circumstance, having a due regard to the nature and quality of his seed, as well as the time and manner in which it is put into the ground, as well as other circumstances. See SOWING.

The most usual quantities and proportions of seed that are made use of in all the different sorts of field-crops, are mentioned under the particular heads to which they belong. See the particular crops.

The writer of the work on "Agricultural Chemistry," thinks

the article of grain or produce. And for this there may also be other reasons, as where the seed is put in at a later period, especially in the spring, it will not have time fully to establish itself in the soil, before it becomes retarded by the hot and dry summer weather, unless a large quantity of seed be employed so as to afford protection by the closeness of the growth of the plants. And in the late autumnal sowings, the grain may not become well fixed and rooted in the soil before the frosts begin to affect them; and on that account a larger proportion of seed be required than under other circumstances would be necessary. Something may likewise depend on the state of the weather in sowing or putting seed into the ground; as where the season is very dry, and there is but a small proportion of moisture in the soil, more of the seed may fail in vegetating, than where the contrary is the case; which also shews the propriety of steeping and putting in the seed in such dry seasons, immediately after the plough has performed its work.

And it must likewise vary according to the manner in which it is deposited in the earth; as where the grain is scattered over the whole of the land, in some measure at random, as in the common broadcast method of sowing, a much larger proportion of seed must be sown, than where the grains are deposited with equality and exactness, but only on certain portions of the land, as in drilling and dibbling. And as some disadvantage may attend the first method, in respect to the vegetation of the seed, a larger proportion may also be requisite on that account. It is consequently evident, that the quantity of seed must vary according to different circumstances, and that it is a matter of much difficulty to fix upon a proportion that may be suitable to all the circumstances and sorts of soil. It is, however, commonly supposed that from two and a half, to three and a half bushels to the acre, may be the proportion that may be the most proper both in the spring and autumn sowings. Mr. Middleton has suggested, that for sowing wheat broadcast about the latter end of September, two bushels and a half is the most advantageous quantity on soils of medium quality; but that for every fortnight later, four quarts of seed should be added to that proportion. But the tabular view given below of the proportions that have been found to answer well in practice in an extensive midland district, on soils of different qualities, may afford a more satisfactory notion of the nature of feeding soils of different kinds and qualities.

It may be necessary, before inserting this however, to shew the quantities in use in a great southern grain district with wheat. In Norfolk, in practice of the best farmers, the proportions of seed-wheat usually made use of, according to the late Agricultural Survey of that district, are about Walton, when dibbled, six or seven pecks, in the practice of some; but with others, when sown before Michaelmas, two bushels, afterwards two and a half. Also near Dereham, the quantity is four bushels broadcast, and when dibbled, from ten pecks to three bushels. At Wisen ten pecks dibbled, and three bushels broadcast; and at East Bilney, and the adjoining parishes, only from two and a half to three. But in the practice of Mr. Henry Blythe of Burnham, seven or eight pecks are drilled per acre; but the common quantity broadcast, from ten to twelve. And in the clays of Marshland, from five to six pecks are sown broadcast. And about Wymondham they dibble in from six to eight pecks, but in the broadcast method sow three bushels. In some situations they however complain of loss from too thin a plant in this sort of crop.

thinks that, in the general selection of seeds, it would seem that those arising from the most highly cultivated varieties of plants, are such as give the most vigorous produce; but that it is necessary from time to time to change, and, as it were, to cross the breeds, which may easily be done by proper means. Mr. Knight has found great advantages to arise from it in wheat, merely by sowing the different sorts together; and states, that "in the years 1795 and 1796, when almost the whole crop of corn in the island was blighted, the varieties obtained by crossing *alone* escaped, though sown in several sorts, and in very different situations. By crossing two varieties of peas, a large fine pea has also been produced, which may probably be cultivated by the farmer with great benefit."

The seeds which are the most perfect and healthy in their nature, are always found to sprout and grow in the best manner as crops, as may be more fully seen under their proper heads. See GERMINATION and VEGETATION.

It is concluded, from a great number of experiments detailed in a paper in the third volume of the Transactions of the Highland Society, "On the Influence of Frost, &c. in ripening Corn," that barley and oats in every period of their growth may be exposed to much variety of bad weather, without being destroyed, and that they even continue to acquire additional weight, although frequently exposed to severe degrees of cold, and occasionally even to frost. That when the last is dry, they not only suffer little from it, but often continue to fill; yet, where moisture prevails with it, they are soon wholly destroyed. But that although this may be the case, exposure in this way renders them very unfit for seed: as while every seed of good corn will vegetate and thrive when properly placed in the soil, where it is good, a great proportion of those which have been thus exposed never appear above the surface, and the plants of those that actually grow are so weak, that the crop is not only small in quantity, but the corn of inferior quality. That, though it seems in using well-ripened corn for seed, the crop which it yields depends, in a considerable degree, on the weight of it, yet this does not happen in any evident degree with corn that has suffered from frost, as the plants arising from corn that has been exposed to much of it are constantly weak, and the produce small, even although the seed be of the common weight. That frost appears still more hurtful to pulse crops as seed, and in other ways, than to those of the grain kind, as well as to grasses. That no corn which has been thus exposed to frost should ever be used as seed; but that which is for this purpose, should always be procured from southern situations, where there is no danger of this sort. That, on the score of economy, the seed which has been so exposed should never be employed; as nearly twice the quantity of it will be required; while the quantity as well as the quality of the produce will be vastly inferior. That this sort of grain is easily distinguished from good corn; the latter being plump, full, and of a peculiar healthy appearance, and mostly free from chaff; while the former is curled and pinched in, and never entirely full, being bleached and chaffy. Where these marks are not present, the mere vegetation of the seeds is, it is said, by no means sufficient, though often depended upon. That, when light seed is made use of, the crops more readily suffer with blight and other diseases, and it would seem that many morbid affections of plants, especially such as give rise to the generation of insects, are particularly apt to spread and communicate the contagion to others that are weak; which, like animals in a state of debility, do not so readily resist it, or the formation of those vermin by which they are most liable to be destroyed, as those plants which

are found and in a vigorous state. That this therefore should be considered as a powerful motive for using only the best corn for seed, a maxim that cannot be too strongly inculcated; as the opinion which has already been hinted at prevails with many, of all seeds that vegetate being nearly equally fit for the production of crops, they frequently make use of the weak light part of their corn for seed, and convert all the best of it into flour or meal; and thus, for a temporary advantage, continue to perpetuate the production of crops that are both small in quantity and of very inferior quality. That, for the prevention of these hurtful consequences, none but the best seeds of every kind should be sown. That, with this view, farmers should not only procure seed that has been well ripened, but such as has been well kept, and never injured by frosts, snows, or rains. That it would also be much for their interest, to wash the whole of their seed-corn in strong brine; not only their wheat but their barley and oats, as well as their beans, pease, and tares; as nothing renders corn so fit for seed as this operation, when properly done: as it not only carries off all the light seeds, but also the seeds of a great many weeds which cannot in any other way be so completely separated from it.

That it is thought, that the preference commonly given to new corn for seed, is not well founded; as it was found that the produce of old corn was equal, both in quantity and quality, to that of the best corn newly reaped. This is the case too with all the grass-seeds that are commonly sown. One of the best crops of hay, which is recollected to have been seen, was produced from a mixture of red, white, and yellow clover, rib-grass, and hay-grass, which, by accident, had been neglected, and kept for six years. An acre, or thereabouts, was sown with this mixture, while the rest of the field was sown with the seed of the preceding year, and the crop was equally good over the whole. That it is hence advised, that in dry warm seasons, when all the grass-seeds are commonly good, such farmers as have it in their power should provide a large quantity of those that they usually sow, to make use of when they are scarce and bad, which constantly happens after cold or wet seasons. That it is on this principle, of the seeds of plants retaining their power of vegetating for a long time, that we account for the sudden appearance of many of the grasses, and other plants, where they had not grown for a long period of time before. After the great fire in London in 1666, broom and clover, it is said, appeared on the site of almost every house in the space of a few months, although the whole had been occupied with streets for several centuries. We daily perceive, it is said, in Scotland and other parts, that white clover appears almost as soon as the heath or other matters are destroyed, with which lands had been occupied before; and it is thought probable, that corn, pulse, and grass-seeds, where they have been found and good at first, and properly kept afterwards, will be found quite fit for seed, even when a good many years old. See the Paper.

SEEDS, in *Gardening*, the small grains or other differently formed bodies, which are produced by plants, trees, or shrubs of almost all kinds after flowering, and which contain in them the little embryo, or essences of the future plants, of each particular sort, which consist of several different parts, but the principal of which are these: the coraculum, the little heart, the point of life, or essential point or part from which the future vegetable is to be produced, and which is the small point or speck that is placed in the centre of each seed, between what are called the cotyledons or the lobes of it, and which is attached thereto, being distinctly visible in most of the bean kind, as well as in almost every other sort of leguminous seeds. It consists of two parts, the

SEED.

the rostellum and the plumula; the former of which constituting the radical or descending part, which strikes downwards into the earth, or soil, and becomes the future root; the latter, which becomes the ascending part, or that which shoots upwards, and constitutes the stem, branches, and other parts of the future plant. This point, or spot in the seed, is likewise sometimes termed *punctum vite*.

The cotyledons, or side-lobes, are the perishable side-lobes, or parts of the seed, which involve, contain, and for some time nourish and support, the corculum, or embryo plant. These side-lobes are for the most part two in number, which are very clearly seen in the bean kind of seeds, as well as in most others derived from the leguminous tribe of plants, especially when they have been previously laid a short time in earth or water. When the seed has been committed to, and deposited in the ground or soil, the corculum, or point of life, if the seed be good, is seldom long before it begins to sprout or germinate and exert itself in it, but the exact length of time which is necessary, is somewhat different in different cases, circumstances, and kinds of seeds; the cotyledons expand, bursting open the outer coverings, and rise in a gradual manner out of the earth or soil, in the form of blades or leaves, which are commonly, in most sorts, termed the *seed-leaves*, in which displaying the first, or primary visible foundation and rudiments of the infant plant; accompanying it for some length of time after its eruption or first breaking from the ground, as until the first proper leaves are formed in the centre of the vegetable, and advanced a little in their growth, when the lobes or seminal leaves becoming useless, they wither, decay, and are destroyed. See GERMINATION.

In general, plants are furnished with two cotyledons, or seed-leaves, especially almost the whole of the tribe of fibrous-rooted herbaceous plants, all trees and shrubs; but there are some which have only one cotyledon, as is the case in most of the bulbous plants of the liliaceous tribe, which rise out of the ground in the manner of a sheath; and there are some seeds which have no cotyledons at all, for instance, such as the ferns, mosses, flags, and funguses.

The other parts of seeds are the *alæ*, or wings, and the coronillæ, or crowns; in the former, many of which are winged, or furnished with a thin membranous web or film, by which means they fly and are assisted in being dispersed about, as in the fir, birch, maple, ash, elm, hops, and a great number of other sorts; and in the latter kind many of the seeds are crowned, and some surrounded with a pappose substance, or a sort of feathery or hairy down, especially in many of the compound and other descriptions, which serve for the purpose of their dissemination, they being thus framed for flying, in a somewhat similar manner to the shuttlecock, so as to be easily carried and transported by the wind to very considerable distances from their natural situations, examples of which are to be met with in hawk-weed, groundsel, dandelion, and many other plants: this, however, is not much the case with garden-seeds of the common kinds. But there are still numerous sorts of seeds which are perfectly simple, having neither any thing of the wing or pappose substance about them; as in most of those employed by the gardener.

It may likewise be observed, that the number, form or shape, size or dimensions, and the substance or solidity of different seeds, are extremely various, as produced by different kinds of garden plants. In respect to the particular number, it may consist of from one, to several hundreds, or even thousands, in a single seed-vessel, according to the particular plant from which it is taken: for though some plants do not afford more than one or two, others three or four,

there are many which have vast numbers of seeds, and are of amazing fertility; as, for instance, in the tobacco-plant, one simple seed-vessel frequently contains not less than about one thousand seeds; and in that of the white poppy plant it is often not lower than eight thousand: the whole produce of one single tobacco-plant is certainly upwards of forty thousand; but some have supposed it to be more than three hundred thousand; and that of one single stalk of spleenwort is conceived from calculation to be above one million of seeds. This is mostly the case in flower and other plants, but rarely in the culinary sorts.

In regard to what concerns the forms of garden seeds, they are, in general, either round, oval, kidney-shaped, heart-shaped, angular, flat, or some other form approaching to some of these. And in relation to the sizes and dimensions of such seeds, they are very different according to the plants from which they are taken, varying from the magnitude of the large nut kind, down to the very minute seeds of cresses, and others, which are still much smaller in their sizes. With respect to the substance and solidity of seeds they vary greatly, some seeds are soft, pulpy, fleshy, others hard and firm without any fleshy matter, some membranous, others hard and long in their natures, which is the case in all the different kinds of the nut tribe, as well as in the stones of many sorts of berries and other stone fruit.

Seeds of the garden sort are likewise either covered or naked; the covered seeds are all such as are contained and concealed in some vessels either of the capsule, pod, berry, apple, pear, cherry, or some other similar kinds; the naked seeds are all those which are not contained in any vessel, but lodged in their receptacles, or in the bottoms of the cups belonging to the different plants or flowers.

There is an almost endless variety in the modes which nature has provided for the diffeminating and dispersing the seeds of plants, which is truly wonderful, though of but little consequence in garden culture; in a very great many plants, the fruit or vessels containing the seed, are raised above the ground, either by erect firm stems, or by climbing stalks, so that the fruit being elevated from the ground, it may be more readily and easily shaken by the wind which blows the seeds not unfrequently to a great distance; for the same reason also, that description of seed-vessels which is called capsule, in some instances, opens at the top, in order that the seeds may be more fully and completely, as well as more readily, dispersed or thrown about. And from a great number of seeds being winged, as has been seen above, they are in that way spread far and near by the winds, and find their passage into different soils and territories. Besides, some seed-vessels are endued with a remarkable degree of elasticity, by means of which they dart and throw their seed with great force to a very considerable distance; of this kind are the plants called touch-me-not, and the spiring cucumber, as well as some others. There are many seeds and seed-vessels too, which are armed with a sort of hooks, hairs, &c. by which they attach themselves to different kinds of animals, or other matters, and are thereby dispersed; such for instance, as in the seed of the carrot, hemp, agrimony, burdock, &c. Further, the seeds of many sorts that are devoured by birds, being carried and voided by them in an entire and perfect state in different parts, often at a very great distance, not unfrequently take root and grow. In berries, as well as other pulpy fruits, which have been eaten as food, the seeds and kernels of many kinds of which pass through the body unhurt, and falling to the ground, likewise not seldom take on a growing state. Seeds are also very frequently carried, diffeminated, and dispersed by brooks, rivers,

SEED.

rivers, torrents, and all sorts of running waters and tides to a great number of leagues distance from their native soils and exposures, where, after being left in such different grounds and climates, they, however, not unfrequently establish and render themselves familiar and agreeable in such new situations. These circumstances are necessary to be known to the gardener, in order that he may guard against the introduction of weeds, &c. more perfectly.

The duration or lasting of seeds, in so far as respects their powers or properties of vegetating or producing new plants, is very considerable indeed; as for instance, those of the cucumber, melon, and gourd, not seldom retain their powers of vegetation for eight, ten, or twelve years; and it has been confidently asserted that those of the mimosa, or sensitive plant, will retain or preserve the principle of life or growth for thirty or forty years or more; while, on the other hand, a far greater number of seeds will not keep good, or in a germinating state, for more than one or two years; and many, or indeed the greatest part of these, will not vegetate properly, if more than one year old, nor some even when kept this short length of time. There are some indeed which require to be sown or put into the ground soon after they become ripe, or they will not grow until the succeeding year; others, unless they are sown immediately after they have been gathered, will not grow at all, as is not unfrequently the case with the berries of the coffee-plant. It has, however, been remarked, that almost all sorts of seeds which have been sown the first year after being collected or gathered, in general rise much sooner, and a great deal stronger, than such as have been kept for a greater length of time; for which reason it is principally advised to have recourse to new seeds, or such as are not more than one year old, wherever it can possibly be done; except in the particular cases of cucumbers and melons, in which seeds of two or three years old, or more, are often more to be preferred, as the plants of this kind, when raised from new seeds, are liable to run or grow much too vigorously to stems or stalks, without becoming either tolerably expeditiously fruitful, or producing fruit in any sufficient quantity.

In regard to the keeping of garden seeds, all such as are produced in dry capsules, or other dry seed-vessels, are found to keep much better and longer in such vessels than if taken out of them; but it is probable that most kinds of seeds will keep and retain their germinative property the longest and most perfectly in the bowels of the earth, when they may have been accidentally deposited and buried to a considerable depth, and out of the reach of the influence of the sun and the air or atmosphere. For it has been noticed respecting the seeds of corn fallow in particular, which have been buried by accident to the depth of three feet or more in the ground for thirty years or more, that on the soil being turned up that depth to the top, they have begun to vegetate and have grown freely. The same thing has likewise been remarked of many other kinds of seeds, which have by chance been deposited in the earth to the depth of several feet; and in the bottoms of wells, vaults, ponds, ditches, and many other similar situations, and which have not been stirred for many years, as is evident from the circumstances of the cases; as when occasion has required the soil or earth to be thrown to the top of the surface, and to be exposed to the sun and air, many seeds have vegetated and plants risen, which had not been remembered to have been seen in such places any time before, or at least for a very great length of time. Most sorts of garden seeds should therefore be kept constantly in the capsules, husks, and other parts in which they are inclosed.

It may also be remarked, that most sorts of seeds, if sown

too deep, remain inactive, and some never exert their vegetative properties at all, while others, notwithstanding, preserve their power of vegetation and growth; and whenever the ground or soil is again fresh stirred, or newly turned up, such of them as happen to approach towards the upper part, will frequently shew themselves, and come up, which fully demonstrates the power and effect which the sun and free air have, in promoting and bringing forward the vegetation of seeds as well as plants. On this account, therefore, it is advised that seeds of this sort should never be sown too deep in the ground, but constantly, in some measure, in proportion to their size, or the quantity of matter which they contain, as from about a quarter or half an inch deep, in the smaller sorts, to about one, two, and sometimes three inches in the middling and large kinds. See *SOWING of Seeds*.

In relation to the vegetation, germination, or growth of seeds, after they have been regularly sown or deposited in the earth or soil to a proper depth, it is very quick in some sorts, while in others it is slow, as for instance, the seeds of cresses, mustard, turnips, and many other sorts, vegetate and come up in a few days, some other sorts in one, two, or three weeks; as in most of the esculent kinds of the kitchen garden, and a great many others of the herbaceous class; but the seeds of parsley and some other kinds of plants often remain in an inactive state for a month or six weeks, and there are still some other sorts which lie one or two years or more in the ground before they germinate and rise in plants. With respect to the seeds of shrubs and trees, there are some which will rise in the course of a month or six weeks, or even in a much shorter time, while others require two or three months to vegetate and grow, and there are some kinds which lie a whole year or more, before they begin to vegetate and grow, as in the case of the hawthorn, the holly, and most others of the very hard long-seeded kinds.

On the whole, these seeds are the deciduous parts of the vegetables to which they belong, each of which includes the rudiment of a new plant, and is endowed with a vital or living principle by means of the sprinkling of the pollen or male dust, which they are capable of retaining for a very considerable length of time when properly kept and preserved.

It is of great importance in the practice of gardening, to be careful in collecting seeds from the best sorts and varieties of the different kinds of plants, to preserve them in a proper manner, and to put them into the ground with due attention to their nature and qualities. Much advantage may likewise be gained in some cases, by keeping them in a suitable manner, and by producing a change in them, from the mixing or combining of different varieties of the same plants, in raising those from which they are taken. Pease have been very greatly improved in this way.

With proper precautions, and with a zeal in any degree resembling that of the late Dr. Solander, of Mr. Blake, who had formed a plan of procuring the seeds of all the vegetables produced in China, which are used in medicine, manufactures, or food, or are in any way serviceable to mankind, and to forward to Europe not only such seeds, but the plants producing them (see Kippis's edit. of *Biog. Brit. art. Blake*), and of Sir Joseph Banks; we might obtain a great variety of curious and useful plants now uncultivated in this country.

The seed of fruit-trees, it is said, should not be chosen from those that are the most fruitful, so much as from the most solid and fair; nor are we to covet the largest acorns, but the most weighty, clean, and bright. Porous, insipid, mild sorts of seeds, are to be sown as soon as ripe; hot, bitter seeds, ought to be kept a year before they are sown. See *SEMINARY*.

The shape and weight of seeds direct how they are to be set ; most of them, when they fall, lie on one side, with the small end towards the earth ; which shews that posture to be best to set any stone or nut in ; if they be heavy, sow them the deeper. Acorns, peaches, &c. are to be sown two or three inches deep. See SEMINATION.

There is a common method of trying the goodness of many sorts of seed, which is by putting them in water ; and those which sink to the bottom are esteemed good, but those that swim on the surface are rejected. This rule, Mr. Miller observes, is not universal ; for having sowed the seeds of melons which floated on the surface of water, they were washed from the pulp, and keeping them two years, they grew very well ; but the melons they produced were not so thick-fleshed as those which he obtained from heavy seeds of the same melon. The lightness of many sorts of seeds he ascribes to their not having been sufficiently impregnated by the farina fecundans ; and, therefore, care should be taken that this operation be properly performed, by not excluding plants that are in flower from the external air, or even by assisting nature in conveying the farina of the male flowers to those of the female. Miller's Gard. Dictionary, art. *Seed*.

SEED, Change of, a term used by the farmers to express the common, and, as they suppose, necessary custom, of changing among one another the seed of their lands, as wheat, and the like ; it being a received opinion, that the seed produced on one land will grow better on another than on that which produced it, though the same species of plant be sown.

Seeds, in their natural climate, do not degenerate, unless culture has improved them ; they then indeed are liable, upon omission of that culture, to return to their natural state again. Whatever benefit arises to the farmer from the changing of the seed of the same species, is from causes which are themselves the effects of different climates, such as heat and moisture, which may vary very much in the same neighbourhood.

Laurembergius has carried this notion of degeneracy and change from the soil, so far as to affirm that wheat will, in some places, degenerate into rye ; and in other places, rye will be exalted into wheat by the soil ; but those who are acquainted with botany know, that a horse might as soon be changed into a bull by feeding in an improper pasture, as one plant degenerate into another by fault of the soil. Tull's Husbandry, p. 116. See *CHANGE of Seed*.

SEEDS, Steeping of, in prolific liquors, is a practice that has occasionally prevailed, and it is not of modern invention. The Romans, who were good husbandmen, have left us several receipts for steeping of grain, in order to increase the powers of vegetation. In England, France, Italy, and in all countries where agriculture has been attended to, a variety of liquors has been recommended for this purpose. The practice is founded on a presumption, that, by filling the vessels of the grain with nourishing liquors, the germ, with its roots, would be invigorated. On this subject Dr. Hunter observes, that all his experiments demonstrate, that steeps have no inherent virtue ; having sown more than once the same seed, steeped and unsteeped, all other circumstances being alike, he never found the least difference in the growth of the crop. When, indeed, the light seeds are skimmed off, as in the operation of brining, the crop will be improved, and diseases prevented ; but these advantages proceed from the goodness of the grain sown, and not from any prolific virtue of the steep. In this opinion many rational farmers, determined by their own experience, concur. Duhamel speaks in the strongest terms against the practice of steeping,

so far as it supposes an impregnation of vegetative particles. Dr. Hunter, having sprouted all kinds of grain in a variety of steeps, assures the farmer, that the radicle and germ never appeared so vigorous and healthy, as when sprouted by elementary water ; whence it appears, that the seed requires no assistance.

Upon the whole he concludes, that as no invigorating or fructifying liquor, however pompously introduced, has ever stood the test of fair and correct experiment, it may be laid down as an established truth, that plump seeds, clear of weeds, and land well prepared to receive it, will seldom disappoint the expectations of the farmer ; and upon these he should rely for the goodness of his crop. Hunter's Evelyn's Silva, p. 15, &c.

SEEDS, in Pharmacy, &c. The medicinal seeds, especially those imported from the Indies, Levant, &c. are severally described under their respective articles ; which see. Among those used with us, the principal are, the four *greater hot*, and the four *greater cold* seeds, as they are called. The first are those of anise, fennel, cumin, and carraway ; the latter, those of gourd, citrul, melon, and cucumber.

The chief use of the four cold seeds is for the making of emulsions, cool refreshing drinks, pastes for the hands, and oils used by the ladies for the complexion.

SEEDS, in Agriculture, a term applied to young grasses, or to lands newly laid to grass, in many cases.

SEED-Furrow, the furrow or ploughing on which the seed is sown, or put in. It is usual, in the last ploughing before sowing, to have the furrow less turned than in other cases. See *PLOUGHING*.

SEED-Grass, a term used to signify cultivated herbage, or grass, raised in opposition to natural grass. See *Artificial GRASSES*.

SEED-Lip, a sort of basket, in which the sower carries his seed, in order to sow it. It is sometimes written *seed-leap*, or *seed-lop*.

A great improvement has lately been made on the common sowing-basket, by a farmer at Malden, in the county of Essex. He has contrived it in such a manner, that the bottom is a wire-sieve, which sifts out the seeds of weeds from the grain, in the motion of sowing ; a cloth bag being attached beneath, for the purpose of catching them.

SEED-Room, the room or place where garden seeds are kept and preserved in, either for the purpose of sale, or future use in sowing and raising crops. Rooms for this purpose should have but little sun, be perfectly free from all sorts of moisture, and be fitted up with every kind of convenience for receiving, hanging, and keeping all descriptions of seeds.

In the arrangement with other garden buildings, the seed-room should have a place as near the hot-house and fruit-room as possible ; but where there are no other buildings, it may have any situation which is ready and convenient for depositing the seeds.

SEED-Seam, the interstice between two plats, as left by the plough ; also the channels made by floating, drilling, &c.

SEED-Weeds, such weeds as arise from the sowing or dispersion of their seeds, and which do not propagate themselves by the roots. See *WEEDS*.

SEED, Amber, Anise, Lac, Line, Mustard, Worm. See the respective articles.

SEED of Pearl. See *PEARL*.

SEEDLINGS, among Gardeners, denote such roots of gilliflowers, &c. as come from seed sown. Also the young tender shoots of any plants that are newly sown.

SEEDLY,

SEEDLY, in *Geography*, a town of Morung; 55 miles N.W. of Amerpour.

SEEDNESS, in *Agriculture*, provincially used for seed time.

SEEDSMAN, a term applied to the labourer or person who scatters, disperses, or puts the seed in or on the ground, in sowing for different sorts of crops, before it is covered. Certain peculiarities of step and cast are requisite in good seedsmen, which are only to be acquired by time, practice, or experience. Expert seedsmen are, of course, but rarely to be met with among farm labourers, though they are of very material importance, in so far as the success, goodness, and beauty of the crops are concerned, as well as in saving much expence in the seed, and other ways: consequently the farmer who does not perform this sort of business himself, will find it to be greatly his interest to have constantly the best, most able, and experienced men of this kind procured for executing the work of sowing; as he will thereby have not only considerable immediate saving, but the advantages of a more certain and favourable appearance, and much greater produce in his crops. It is hardly to be conceived, except by those conversant in the matter, how great the waste and injuries are, which are committed by seedsmen who are not well acquainted, experienced, and expert in the business of sowing. They are, besides, in many instances, incapable of getting on with the work with that expedition which is necessary; which is a very great inconvenience and loss to the farmer at this very busy season of the year, when every thing of this sort ought to be in the greatest activity. See **SEED** and **SOWING**.

It is also a term which is made use of to signify the person who keeps a shop, or other place, for the sale of seeds, either to the farmer, or the gardener, or any other persons. These seed-dealers have sometimes the name of garden seedsmen. The London seed-dealers are a very considerable class of men, who do much business in the disposing of all sorts of seeds which are necessary to be employed in the practice of farming and gardening, as well as in different other ways.

The garden seedsmen is commonly the gardener himself, other persons being never, or very rarely, employed in sowing any sort of garden crop.

SEEDY, in the *Brandy Trade*, a term used by the dealers to express a fault that is found in several parcels of French brandy, and which renders them unsaleable. The French suppose that these brandies obtain the flavour, which they express by this name, from the weeds which grew among the vines, from whence the wine, of which this brandy was made, was pressed.

However it be, the thing is evident, and the taste not of any one kind; but some pieces of brandy shall taste strongly of aniseed, some of carraway seed, and some of other of the strong flavoured seeds of plants, principally of the umbelliferous kind; so that it shall be rather taken for aniseed, carraway, or some other water, than for brandy.

The proprietor of such brandies is always at great trouble to get them off, and usually is reduced to the necessity of mixing them in small quantities with pieces of other brandies, so as to drown and conceal the taste; and where he has not opportunities of doing this, he is obliged to sell them on very disadvantageous terms.

The business of rectification of spirits is very little understood abroad, though much practised with us; and a man in France or Holland, who could take off this taste from these brandies, might get great advantages by it. There is no doubt but that the same means, which we use to rectify malt spirits, that is, to clear it of its nauseous and

stinking oil, which always arises with it in the first distillation, would also serve to purify these brandies, and by leaving the extraneous oils behind, render them as well tasted as any others; since there is no question, but that the oil of malt, which is a principle of the same ingredient with the spirit, is more firmly united to it than these flavouring oils in the brandy, which are not the produce of the grape, but of some foreign matter only accidentally mixed with it. See **BRANDY** and **SPIRITS**.

It is a mistake to imagine, that all brandies made in France are so fine as those which we meet with on the quays of London; on the contrary, there are many hundred pieces made every year, which are as badly flavoured as our coarsest malt spirit. But the case is this, they send the best brandies, and the best wine, to England, where they can get the best prices for them. In Holland, on the contrary, the mart of goods of all sorts, it is sometimes difficult to select one piece of good brandy out of fifty, the general run of them being either seedy, or musty, oily, or otherwise infected with some unnatural and disagreeable flavour: and these are the sorts which in France they despair of curing by redistillation, or bringing to the state of three-fifths, or *trois cinques*, as they express their stronger brandies. Shaw's Essay on Distillery.

SEEDY Abdel Abbas, in *Geography*, a town of Tunis, anciently called "Musti;" 16 miles N.E. of Keft.

SEEDY Abdelmoumen, a town of Algiers, in the province of Tremecen, on the coast of the Mediterranean, having a good road for ships. It derives its name from a celebrated prophet, whose tomb the inhabitants hold in great veneration; 4 miles S.W. of Mejerda.

SEEDY Abdullah, a town of Morocco, on the coast of the Atlantic; 30 miles N. of Mogador.

SEEDY Abid, a town of Algiers, in the province of Tremecen, at the conflux of the Arhew and the Shelliff, held as a sanctuary; 30 miles E. of Mustygnanim.

SEEDY Bofgannim, a town of Tunis; 40 miles S.W. of Keft.

SEEDY Busrocton, a town of Morocco, on the coast of the Atlantic; 10 miles N. of Mogador.

SEEDY Doude, a town of Africa, in the kingdom of Tunis, at the north extremity of the peninsula of Dakkul, surrounded with the ruins of the ancient Misna. Its present name is derived from Doude, or David, a Moorish saint, whose sepulchre, as they shew it, is five yards long. But, according to Dr. Shaw (in his Travels), this is really a fragment of some Roman prætorium, as he is led to conjecture from three tessellated or mosaic pavements, wrought with the most exact symmetry; and executed with all the artful wreathings and variety of colours imaginable, and with an intermixture of figures of horses, birds, fishes, and trees, curiously inlaid, so that they appear more gay and lively than many tolerably good paintings; 10 miles S.W. of Cape Bon.

SEEDY Eefah, a town of Algiers, anciently called Sava; 25 miles S. of Boujeiah.

SEEDY Meddub, a town of Africa, in the kingdom of Tunis; 20 miles N. of Gabs.

SEEDY Nedja, a town of Algiers; 26 miles E. of Burg Hamza.

SEEDY Occuba, a town of Africa, in the province of Zaab, famous for a tomb of an Arabian general of that name, and for that of Seedy Lafcar, its tutelary saint; 15 miles S.E. of Biscara.

SEEFELDT, a town of Austria; 6 miles W. of Laab.

SEEHAUSEN, a town of Brandenburg, in the Old Mark,

Mark, on the river Aland, which almost surrounds it; 40 miles N.W. of Brandenburg. N. lat. $52^{\circ} 53'$. E. long. $11^{\circ} 59'$.—Also, a town of the duchy of Bremen; 3 miles W. of Bremen.—Also, a town of Westphalia, called "Sommerchenburg," in the duchy of Magdeburg; 18 miles W. of Magdeburg.

SEEHAUSZ, a citadel of Germany, in the lordship of Schwarzenberg, on a lake; 6 miles S. of Scheinfeld.

SEE-HOO, or Si-HOU, a lake of China, on the borders of which stands the wealthy and extensive city of Hang-choo-foo, or *Hang-tcheou-fou*; which see. This lake, with the surrounding scenery, is accounted one of the grandest, as well as most beautiful, spots in all China. The Lufang-ta, or tower of the thundering winds, standing on the point of a promontory, jutting into the lake, forms a bold object. It is said to have been built in the time of the philosopher Confucius, who lived centuries before the Christian era. The vale of tombs has an almost infinite variety of ornaments. Naked coffins in great abundance lie scattered upon the ground, and the sides of the hills that rise from the vale are thickly set with groups of sarcophagi, in the shape of small houses, arranged in such a manner as to have the appearance of so many Lilliputian cottages. In the plates annexed to Staunton's Voyage, we have an interesting view of this lake.

SEEHURAH, a town of Hindoostan, in Gurry-Mundella; 25 miles N. of Gurrah.

SEEING, the act of perceiving objects by the organ of sight; or, it is the sense we have of external objects, by means of the eye.

For the apparatus, or disposition of the parts necessary to seeing, see EYE. For the manner in which seeing is performed, and the laws of it, see VISION.

Our best anatomists differ greatly as to the cause why we do not see double with the two eyes. Galen, and others after him, ascribe it to a coalition, or decussation of the optic nerve, behind the os sphenoides. But whether they decussate or coalesce, or only barely touch one another, is not so well agreed.

The Bartholines and Vesalius say expressly, they are united by a perfect confusion of their substance; Dr. Gibson allows them to be united by the closest conjunction, but not by a confusion of their fibres.

Alhazen, an Arabian philosopher of the 12th century, accounts for single vision by two eyes, by supposing that when two corresponding parts of the retina are affected, the mind perceives but one image.

Descartes, and others, account for the effect another way; viz. by supposing that the fibrillæ constituting the medullary part of those nerves, being spread in the retina of each eye, have each of them corresponding parts in the brain; so that when any of those fibrillæ are struck by any parts of any image, the corresponding parts of the brain are affected thereby.

Somewhat like which is the opinion of Dr. Briggs, who takes the optic nerves of each eye to consist of homologous fibres having their rise in the thalamus nervorum opticorum, and being thence continued to both the retinae, which are composed of them; and farther, that those fibrillæ have the same parallelism, tension, &c. in both eyes; consequently, when an image is painted on the same corresponding sympathizing parts of each retina, the same effects are produced, the same notice carried to the thalamus, and so imparted to the soul. Hence is that double vision ensuing upon an interruption of the parallelism of the eyes; as when one eye is depressed by the finger, or their sympathy is interrupted by disease: but Dr. Briggs maintains,

that it is but in few subjects there is any decussation; and in none any conjunction more than mere contact.

Dr. Briggs's notion is by no means consonant to facts, and is attended with many improbable circumstances.

It was the opinion of sir Isaac Newton, and of many others, that objects appear single, because the two optic nerves unite before they reach the brain. But Dr. Porterfield shews, from the observation of several anatomists, that the optic nerves do not mix, or confound their substance, being only united by a close cohesion; and objects have appeared single, where the optic nerves were found to be disjointed. To account for this phenomenon, this ingenious writer supposes, that, by an original law in our natures, we imagine an object to be situated somewhere in a right line drawn from the picture of it upon the retina, through the centre of the pupil; consequently the same object appearing to both eyes to be in the same place, the mind cannot distinguish it into two.

In answer to an objection to this hypothesis, from objects appearing double when one eye is distorted, he says, the mind mistakes the position of the eye, imagining, that it had moved in a manner corresponding to the other, in which case the conclusion would have been just: in this he seems to have recourse to the power of habit, though he disclaims that hypothesis. This principle, however, has been thought sufficient to account for this appearance.

Originally, every object making two pictures, one in each eye is imagined to be double; but, by degrees, we find that when two corresponding parts of the retina are impressed, the object is but one; but if those corresponding parts be changed by the distortion of one of the eyes, the object must again appear double, as at the first. This seems to be verified by Mr. Chefelden, who informs us, that a gentleman, who, from a blow on his head, had one eye distorted, found every object to appear double, but by degrees the most familiar ones came to appear single again, and in time all objects did so without amendment of the distortion. A similar case is mentioned by Dr. Smith.

On the other hand Dr. Reid is of opinion, that the correspondence of the centres of two eyes, on which single vision depends, does not arise from custom, but from some natural constitution of the eye and of the mind.

M. du Tour adopts an opinion, long before suggested by Gassendi, that the mind attends to no more than the image made in one eye at a time; in support of which he produces several curious experiments; but as M. Buffon observes, it is a sufficient answer to this hypothesis, that we see more distinctly with two eyes than with one; and that when a round object is near us, we plainly see more of the surface in one case than in the other.

With respect to single vision with two eyes, Dr. Hartley observes, that it deserves particular attention, that the optic nerves of men, and such other animals as look the same way with both eyes, unite in the fella turcica in a ganglion, or little brain, as it may be called, peculiar to themselves, and that the associations between synchronous impressions on the two retinas must be made sooner, and cemented stronger on this account; and that they ought to have a much greater power over one another's images than in any other part of the body. And thus an impression made on the right eye alone by a single object, may propagate itself into the left, and there raise up an image almost equal in vividness to itself; and, consequently, when we see with one eye only, we may, however, have pictures in both eyes.

It is a common observation, says Dr. Smith, that objects seen with both eyes appear more vivid and stronger than they do to a single eye, especially when both of them are equally good.

good. Porterfield on the Eye, vol. ii. pp. 285. 315. Smith's Optics, Remarks, p. 31. Reid's Inquiry, p. 267. Mem. Presentes, p. 514. Acad. Par. 1747. M. p. 334. Hartley on Man, vol. i. p. 207. Priestley's Hist. of Light and Colours, p. 663, &c.

Whence it is that we see objects erect, when it is certain that the images of them are painted invertedly on the retina, is another difficulty in the theory of seeing.

Descartes accounts for it hence, that the notice which the soul takes of the object does not depend on any image, nor on any action coming from the object, but merely on the situation of the minute part of the brain whence the nerves arise. *E. gr.* the situation of a capillament of the optic nerve corresponds to a certain part of the brain, which occasions the soul to see all those places lying in a right line therewith.

But Mr. Molyneux gives us another account: the eye, he observes, is only the organ or instrument; it is the soul that sees. To enquire, then, how the soul perceives the object erect by an inverted image, is to inquire into the soul's faculties. Again, imagine that the eye receives an impulse on its lower part, by a ray from the upper part of an object, must not the vivive faculty be hereby directed to consider this stroke as coming from the top, rather than the bottom of the object; and, consequently, be determined to conclude it the representation of the top?

Upon these principles, we are to consider, that inverted is only a relative term, and that there is a very great difference between the real object and the means or image whereby we perceive it. When all the parts of a distant prospect are painted upon the retina (supposing that to be the seat of vision), they are all right with respect to one another, as well as the parts of the prospect itself; and we can only judge of an object being inverted, when it is turned reverse to its natural position with respect to other objects which we see and compare it with.

The eye, or vivive faculty, (says Molyneux) takes no notice of the internal surface of its own parts, but uses them as an instrument only, contrived by nature for the exercise of such a faculty. If we lay hold of an upright stick in the dark, we can tell which is the upper or lower part of it, by moving our hand upwards or downwards; and very well know, that we cannot feel the upper end by moving our hand downwards. Just so, we find by experience and habit, that upon directing our eyes towards a tall object, we cannot see its top by turning our eyes downward, nor its foot by turning our eyes upward; but must trace the object the same way by the eye to see it from head to foot, as we do by the hand to feel; and as the judgment is informed by the motion of the hand in one case, so it is also by the motion of the eye in the other. Molyneux's Dioptr. p. 105, &c. Muschenbroeck's Int. ad Phil. Nat. vol. ii. p. 762. Ferguson's Lectures, p. 132. See on the subjects of this article, our account of the physiology of the eye, under EYE.

SEEING Faith. See FAITH.

SEEKIRCHEN, in *Geography*, a town of the archbishopric of Salzburg, on the Waller See; 4 miles N. of Salzburg.

SEEKPORUM, a town of Hindoostan, in Boggilcund; 35 miles N.N.E. of Rewah.

SEEL, in *Agriculture*, a term provincially applied to time or season in respect to crops, as hay seel, or hay time, barley seel, or barley feed time, bark seel, or the barking season, &c. It is sometimes written *seal*.

SEELAND, in *Geography*. See ZEALAND.

SEELANG, a small island in the East Indian sea, near

the S. coast of the island of Bachian, with which it forms a good inner and also outer harbour.

SEELBURG, or SEHNPIILLS, a town of the duchy of Courland, on the Dwina, where the bishops of Semigallia formerly resided, and who, on that account, were called bishops of Seelburg; 50 miles S.E. of Riga.

SEELING. A horse is said to *feel* when he begins to have white eye-brows, that is, when there grows on that part about the breadth of a farthing of white hairs, mixed with those of his natural colour, which is a mark of old age.

It is said a horse never feels till he is fourteen years old, and always does before he is sixteen. The light sorrel and black sooner feel than any other.

Horse-jockies usually pull out those hairs with pincers: but if there be so many that it cannot be done without making the horse look bald and ugly, then they colour their eye-brows, that they may not appear old.

SEELING, in *Falconry*, is the running a thread through the eye-lids of a hawk, when first taken, to make her endure the hood the better.

SEELING, at *Sea*, is used in the same sense nearly with heeling: when a ship lies down constantly, or steadily, on one side, the seamen say she *heels*; and they call it *seeling*, when she tumbles on one side violently and suddenly, by reason of the sea forsaking her, as they call it, *i. e.* the waves leaving her for a time in a bowling sea. When a ship thus tumbles to leeward, they call it *lee-feel*; and in this there is not much danger, even in a storm, because the sea will presently right her up again; but if she rows or feels to windward, there is fear of her coming over too short or suddenly, and so by having the sea break right into her, be either foundered, or else have some of her upper works carried away.

SEELINGAN, in *Geography*, a small island in the Sooloo Archipelago. N. lat. 6° 4'. E. long. 118° 15'.

SEELKEN, a town of Prussia, in the province of Nantangen; 9 miles W.N.W. of Liel.

SEELOW, a town of Brandenburg, in the Middle Mark; 10 miles W. of Custrin.

SEEM, or SEME. See SEAM.

SEE-MA-KOANG, in *Biography*, a Chinese mandarin and philosopher of the eleventh century, who enjoyed the favour of the emperor, and had several important places, which he resigned and retired to a solitary place, where he wrote a history of China, commencing at the 403d year before the Christian era. He was author likewise of some moral treatises.

SEEMO, in *Geography*, a town of Africa, in Kaffon. N. lat. 14° 25'. E. long. 8° 45'.

SEENEENDOONG, a small island in the East Indian sea, near the N. coast of Borneo. N. lat. 7° 48'. E. long. 117° 45'.

SEENGHOO, a large town of the Birman empire, situated on the Irawaddy, having in its neighbourhood, and for a great distance along the eastern bank of the river, small temples built close to the water; 10 miles S. of Pagahm.

SEER, a town of Hindoostan, in Malwa; 50 miles E.S.E. of Shajehanpour.

SEEPARRAN, a small island in the East Indian sea, near the east coast of Borneo. N. lat. 4° 8'. E. long. 118° 23'.

SEER, *Principality of*, a petty sovereignty of Arabia, extending from Cape Muslindom along the Persian gulf. The Persians call it the country of Dsjulfar, another cape near Muslindom. The Europeans also call the inhabitants

bitants the Arabs of Dsjulfar. The other Arabs call it Seer, from the town of the same name, which has a good harbour, and is the seat of the scheick. He formerly possessed and still retains the isle of Scharedsje, with some considerable places upon the opposite side of the gulf, among which are Kunk and Lundsje. This country not long since acknowledged the sovereign authority of the Imam; but it has withdrawn itself from this condition of dependence; and the scheick often goes to war with his old master; but without assistance, he is not able to defend himself. He takes care, however, to live upon good terms with the other independent scheicks, especially with the scheick of Dsjau, whose dominions lie westward from Oman. The prince of Seer makes some figure among the maritime powers in these parts. His navy is one of the most considerable in the Persian gulf. His subjects are much employed in navigation, and carry on a pretty extensive trade. N. lat. 25°. E. long. 54° 38'. Niebuhr's Travels into Arabia, vol. ii. Eng. ed.

SEERD, a town of Asiatic Turkey, in the province of Diarbekir; 55 miles E. of Diarbekir.

SEERKA, a town of Bengal; 25 miles E. of Palamow.

SEERPOUR, a town of Bengal; 18 miles W. of Moorhedabad.—Also, a town of Bengal; 25 miles N.E. of Nattore.—Also, a town of Hindoostan, in Allahabad, on the Ganges; 40 miles E. of Gazypour.—Also, a town of Hindoostan, in the circar of Sumbul; 40 miles S. of Nidjibabad.—Also, a town of Hindoostan, in Bahar; 15 miles W. of Patna.—Also, a town of Hindoostan, in Bahar; 9 miles N. of Arrah.

SEERSY, a town of Bengal; 40 miles S.S.W. of Burdwan. N. lat. 22° 39'. E. long. 87° 35'.

SEERWAY, a town of Hindoostan, in Myfore; 10 miles N. of Chinna Balabaram.

SEES, a town of France, in the department of the Orne, and chief place of a canton, in the district of Alençon, before the revolution the see of a bishop, suffragan of Rouen; 2½ posts N. of Alençon. The town, situated on the Orne, contains 5471, and the canton 10,848 inhabitants, on a territory of 210 kilometres, in 18 communes. N. lat. 48° 36'. E. long. 0° 15'.—Also, a river of France, which runs into the sea near Mount St. Michel.

SEESEEN, a town of Westphalia, in the principality of Wolfenbüttele; 4 miles E. of Gandersheim.

SEESKAR, a small island in the gulf of Finland. N. lat. 60° 5'. E. long. 25° 11'.

SEESUCUNDA, a town of Africa, in Woolly. N. lat. 13° 25'. W. long. 12° 54'.

SEETACON, a town of Hindoostan, in Bengal; 18 miles N. of Islamabad.—Also, a town of Bengal; 15 miles N. of Curuckpour.

SEETAPOON, a town of Bengal; 20 miles N.N.W. of Islamabad. N. lat. 22° 37'. E. long. 91° 48'.

SEETRUNGE, a river of Hindoostan, which rises in Guzerat, and runs into the gulf of Cambay; 4 miles E. of Sultanpour.

SEETUL, a town of Bengal; 13 miles N. of Mauldah.

SEEEVE, a river which runs into the Elbe, near Haarburch.

SEEWAH. See SIWA.

SEEWALD, a town of Prussia, in the province of Oberland, near Deutsch Eylau.

SEEWEE BAY. See SEWEE.

SEFAKIN, a town of Arabia, in the province of Yemen; 60 miles S.E. of Lohia.

SEFATIANS, a sect of Mahometans, who held the opposite opinion to the Moatazalites, with respect to the eternal attributes of God, which they affirmed, making no distinction between the essential attributes, and those of operation; and hence they were named Sefatians, or Attributists. See MOATAZALITES.

The doctrine of the Sefatians was that of the first Mahometans, who were not yet acquainted with these nice distinctions; but this sect afterwards introduced another species of declarative attributes, or such as were necessarily used in historical narration, as hands, face, eyes, &c. which they did not offer to explain, but contented themselves with saying they were in the law, and that they called them "declarative attributes." At length, by introducing various explications and interpretations of these attributes, they divided into many different opinions; some, by taking the words in the literal sense, fell into the notion of a likeness or similitude between God and created beings, to which it is said the Karaites or Caraites among the Jews, who are for the literal interpretation of Moses's law, had shewn them the way:—others explained them in another manner, saying that no creature was like God, but that they neither understood, nor thought it necessary to explain the precise signification of the words which seem to affirm the same of both; it being sufficient to believe that God hath no companion or similitude.

The sects of the Sefatians are, 1. The "Asharians," or followers of Abu'l Hafan al Ashari, who allowed the attributes of God to be distinct from his essence, yet so as to forbid any comparison to be made between God and his creatures; and who, as to predestination, maintained that God hath one eternal will, and that he willeth both the good and evil, the profit and hurt of men, and who have even said, that God may even command man to do what he is not able to perform; and as to mortal sin they taught, that if a believer guilty of such sin die without repentance, his sentence is to be left to God, whether he pardon him out of his mercy, or whether the prophet intercede for him, or whether he punish him according to his demerit, and afterwards, through his mercy, admit him into paradise; but that it is not to be supposed he will remain for ever in hell with the infidels:—such were the more rational Sefatians, who were very different from—2. The "Moshabbehites," or "Assimilators." (See MOSHABBEHITES.) 3. The "Keramians," called also "Mojasslemians," or "Corporealists," who declared God to be corporeal. (See KERAMIANS.) 4. The "Jabarians." (See JABARIANS.) 5. The "Morgians," said to be derived from the Jabarians, who teach, that the judgment of every true believer that hath been guilty of a grievous sin, will be deferred till the resurrection, and that disobedience with faith is not injurious, but, on the other hand, that obedience with infidelity doth not profit. The Morgians are distributed into four species; three of which, according as they happen to agree in particular dogmas with the "Kharejites" the "Kadarians," or the "Jabarians," are distinguished as Morgians of those sects, and the fourth is that of pure Morgians, and this species is subdivided into five others. The opinions of Mokatel and Basfar, both belonging to a sect of Morgians, called "Thaubanians," are as follow. The former asserted that disobedience hurts not him who professes the unity of God and is endowed with faith, and that no true believer shall be cast into hell; he also taught that God will certainly forgive all crimes besides infidelity; and that a disobedient believer will be punished at the resurrection, on the bridge laid over the midst of hell, where the flames of hell-fire shall catch hold on him, and torment him in proportion to his disobedience, and that he shall

shall then be admitted into paradise. The latter held, that if God do cast the believers guilty of grievous sins into hell, yet they will be delivered thence after they shall have been sufficiently punished; but that it is neither possible nor consistent with justice, that they should remain there for ever. Sale's Koran—Prel. Disc.

SEFIDROU, in *Geography*, a town of Persia, in the province of Farfistan; 114 miles S.W. of Schiras.

SEFROI, a town of Africa; 20 miles S.E. of Fez.

SEFURA, a town of Africa, in Foota. N. lat. $10^{\circ} 30'$. W. long. $10^{\circ} 25'$.

SEG, in *Rural Economy*, the name of a castrated bull.

SEGAGHEE, in *Geography*, a town of the Birman empire, on the Irawaddy; 6 miles from Deneebow.

SEGALLA, a gold mine of Africa, in the kingdom of Bambouk.

SEGAR, Sir WILLIAM, in *Biography*, garter king at arms, was author of "Honour Civil and Military," folio, 1602. He was imprisoned for granting the royal arms of Arragon, with a canton of Brabant, to George Brandon, the common hangman, but it being very evident that he had been imposed upon he was released. He died in 1633. Edmonson's Baronage is said to have been principally taken from Segar's MSS.

SEGAR, in *Geography*. See SADSKAR.

SEGARDEE, a town of Hindoostan, in Golconda; 30 miles W.N.W. of Hydrabad.

SEGARGIUM, a town of Thibet; 52 miles S.W. of Zuenga.

SEGEBOURG, a town of the duchy of Holstein, the name of which is derived from a castle built there by the emperor Lotharius in the year 1137, of which few vestiges now remain; 18 miles N.W. of Lubeck. N. lat. $53^{\circ} 58'$. E. long. $10^{\circ} 19'$.

SEGED, a town of Nubia; 30 miles S. of Sennaar.

SEGEDA, in *Ancient Geography*, a very celebrated town of Spain, in Bætica, in the interior of the country, between the coast of the ocean and the river Tader, according to Pliny.—Also, a large and powerful town of Spain, in Celtiberia, belonging to the people called Bessi, according to Appian.

SEGEDIN, in *Geography*. See ZEGEDIN.

SEGEDUNUM, in *Ancient Geography*, a town on the confines of Dacia, on the river Tibiscus, which belonged to the Jazyges.

SEGEDUNUM, one of the eighteen stations on the wall of Severus, in English "Cousins'-house," being the first station reckoning from east to west, three miles five furlongs and one and a half chain from the next station to the west of it. See STATION.

SEGEHERAD, in *Geography*, a town of Norway, in the province of Christiania; 24 miles W. of Christiania.

SEGELOCUM, in *Ancient Geography*, a town of the isle of Albion, in the 5th Iter of Antonine, between Lindum and Danum. All our antiquaries agree in placing Segelocum, which is called Agelocum in 8th Iter, at Littleborough, between Lincoln and Doncaster, where Roman coins, altars, and other ancient remains have been found.

SEGELSBURG, in *Geography*, a town of the duchy of Bremen; 5 miles E. of Bremen.

SEGERA, a town of Arabia, in the province of Hedjas; 5 miles S. of Medina.

SEGERS, or SEGHES, GERARD, in *Biography*. This eminent painter was born at Antwerp in 1589. He was first a pupil of Henry van Balen, but afterwards entered the school of Abraham Janssens, and had made considerable progress in the art when he went to Italy. On his arrival

at Rome, he attached himself as a disciple to Bartolommeo Manfredi; and from him adopted a taste for the vigorous style of Michael Angelo Caravaggio. To the strength of contrast, which he thus adopted, he added somewhat of the tone and colour he had brought with him from his native country; producing the powerful effect of candle-light, though often falsely applied in subjects which appertain to the milder illumination of the day. By skilful productions of this nature, he acquired very considerable fame, and was at length invited by the cardinal Zapara, the Spanish ambassador at Rome, to accompany him to Madrid. He accepted the invitation, and was presented by the cardinal to the king, who received him in the most gracious manner, and engaged him in his service, with a considerable pension. He employed himself at Madrid in painting several historical subjects, and some musical conversation pieces, which were greatly admired; but after remaining there some years, the desire of revisiting his native country induced him to request permission to retire. His renown had reached Flanders, and his fellow-citizens were impatient to possess some of his productions; yet, when he had arrived there, and executed some paintings in his strong manner, they, whose eyes had been accustomed to the pure brilliant hues, and clear contrasts of Rubens and Vandyke, were unable to yield him that harvest of praise to which he had been accustomed, and he was obliged to change his manner, and adopt a more tender and agreeable style. The facility with which he effected this change, proves his power over the materials of the art, and his judgment in its principles; and many of his latter pictures bear evident testimony in support of his general ability. His most esteemed production is or was the principal altar-piece in the church of the Carmelites at Antwerp, the subject of which is the Marriage of the Virgin. Vandyke painted his portrait among the eminent artists of his country, which is engraved by Pontius. He died in 1651, aged 62.

SEGERS, DANIEL, was the younger brother of Gerard, and born at Antwerp in 1590. His taste leading him to design fruit and flowers, he was placed as a disciple with J. Brughel. At the age of 16 he entered the society of the Jesuits, and abandoned painting during his novitiate, but when that term expired, he obtained permission of his superior to visit Rome, where his brother was then flourishing with distinction; and he also acquired considerable celebrity, by the fidelity and skill with which he imitated the beauty and variety of those objects of creation, as flowers, plants, and insects, which he chose for his models.

His productions were sought with avidity, and his talents were not unproductive even to his convent, which received valuable tributes in return for those ingenious and entertaining treasures of art. He appears, indeed, to have painted more for the benefit of the wily society to which he had attached himself, than for his private advantage: and when he had produced his most celebrated picture, at the command of the prince of Orange, it was presented to that monarch in the name of the society, which was munificently recompensed in return. He frequently painted garlands of flowers, as borders for pictures, which were filled up with historical subjects by the first painters. He died at Antwerp in 1660, aged 70.

SEGESTA, or ÆGESTA, or *Segeste*, in *Ancient Geography*, a town in the interior of Sicily, W. of Panormia. It had a harbour and gulf of the same name. The harbour was called "Segestanorum emporium," according to Ptolemy.

Thucydides represents it as a maritime town, and speaks of the navigation at Ægesta. This ancient name is said to have

have been given to the place by Egeftus the Trojan, who is faid to have been one of its founders; but the Romans pretend that it was founded by Æneas. Its ruins are ftill vifible. The mineral waters of this place were called "Segeftanæ aquæ:" and they are placed in the Itinerary of Antonine on the route from the Lilybæan promontory to Tyndaris, between Drepanum and Parthenicum.

SEGESTA *Tiguliorum, Seftri*, a town of Italy, in the interior of Liguria, towards the eaft. It was anciently confiderable.

SEGESTAN, or SEISTAN, in *Geography*, a province of Perfia, formerly called "Nimrofe," from a fabulous tradition that it was once under water, and that it was drained in the fhort fpace of half a day by the Genii, comprehends part of Ariana and the country of the Sarangæans, and is bounded on the N. and N.W. by Khorafan, E. by Candahar and Zableftan, and S. and S.W. by Mekran and Kerman. The greater part of this province is flat, fand-y, and uninhabited. A wind blows for a hundred and twenty days, during the hot months, with fuch violence as to overwhelm with clouds of fand, houfes, gardens, and fields. Although Segeftan is now reduced to a deplorable condition, it once rivalled in prosperity the moft flourishing provinces of the empire. The noble river Heermund (the ancient Ety-mander), navigable for boats from Bof to Zarang, flows through the extent of it, from the mountains of Hazara, beyond Cabul to the lake of Zerrah. Capt. Chrifkie, who travelled in 1810 through the heart of Seiftan, reports that from Noofhky, in northern Mekran, to the banks of the Heermund, the country was a mere defert, interfefted with fand-hills, and that he did not fee a fingle town, or even village, in the way; the only inhabitants of this wild being a few Balouche and Patan fhepherds, who lived in tents pitched in the vicinity of the fprings. He reached the Heermund in N. lat. $30^{\circ} 24'$. E. long. $64^{\circ} 16'$, and followed the banks of that river for about feventy or eighty miles. Its courfe lies through a valley, varying in breadth from one to two miles, the defert rifing on either fide in perpendicular cliffs. The valley, irrigated by the waters of the river, is covered with verdure and brushwood. Our traveller found an aftonifhing number of mixed towns, villages, and at one of thefe, Kulcaupul, a noble palace in a tolerable ftate of prefervation. The remains of a city, named "Poolkee," he defcribes as immente. The Heermund is four hundred yards wide, very deep; the water being remarkably fine, and the banks cultivated for half a mile on each fide. The prefent capital of Seiftan is "Doofhak," fuppofed to be the fame with the ancient Zarang, and now the refidence of the prince of Seiftan, fituated in N. lat. $31^{\circ} 8'$. E. long. $63^{\circ} 10'$; about eight or nine miles from the river. It is fmall and compact, but the ruins cover a vaft extent of ground. It is populous, has a good bazar, and the inhabitants, drefled in the Perfian manner, appeared more civilized than the other natives of the province, who are either Patan or Balouche fhepherds, men of wandering life, and pitching their tents under the ruins of ancient palaces. The country in the vicinity of the town is open, well cultivated, and produces wheat and barley fufficient for exportation to Herat; the pafturnage alfo is good and abundant. The revenues of the chief of Seiftan amount to no more than 80,000 rupees, and he can bring into the field about 3000 men. Twenty-five miles N. of Doofhak are the ruins of a very large city, named "Pefhawaran," and a few miles beyond that the remains of another, called "Jouen." Ferrah, or Ferah, is diftant ffty-five miles from Doofhak; and it is defcribed as a very large walled town, fituated in a fertile valley, on a river which flows into the lake of

Zerrah, or Zara, and nearly half-way between Candahar and Herat.

Seiftan is, at prefent, divided into a number of fmall independent ftates, governed by chiefs, who live in fortified villages, fituated principally on the banks of the Heermund. About ten days' journey from Doofhak is the city of Kub-beer, fituated in the middle of the defert, fifteen days' march from Kerman and fixteen from Yezd. The whole of the intermediate fpace is an arid wafte, interfefted with one or two ranges of mountains. Through this defert is a path, by which Caffids, or couriers, can go from Kerman to Herat in eighteen days; but the rifk of perifhing is fo great, that a perfon of that defcription demands 200 rupees for the carriage of a letter. Kinner's Mem. of the Perfian Empire.

SEGESTE, in *Ancient Geography*, a town of Iftria, belonging to the Carni, according to Pliny. Strabo places it in Pannonia, at the confluence of feveral navigable rivers, fo that the Romans eftablifhed their magazines in it, during their war with the Dacians.

SEGESTE, a town of Italy, in Liguria, S.E. of Portus Delphini.

SEGESVAR, in *Geography*. See SCHESBURG.

SEGETICA, in *Ancient Geography*, a town of European Myfia, or of Mæfia, of which Cræffus gained poffeffion, according to Dion Caffius.

SEGEZ, in *Geography*, a river of Ruffia, which forms a communication between the lakes Sig and Vig, in the government of Olonetz.

SEGGARS, in the *Manufecture* of porcelain and pottery, are cafes formed of coarfer clays, but which are capable of fufstaining the required heat without fufion; in which different kinds of earthenware are baked. See PORCELAIN and POTTERY.

SEGGERA, in *Ancient Geography*, a town of Africa Propria, according to the Itinerary of Antonine.

SEGIDA, a town of Spain, in Celtiberia. Steph. Byz. and Strabo.

SEGILMESSA, in *Geography*. See SUGULMESSA.

SEGISA, in *Ancient Geography*, a town of Spain, in the Tarragonenfis, in the interior of the country of the Bariftani.

SEGISAMA, and *Segifama Julia*, a town of Spain, in the Tarragonenfis, depending upon the Vaccæans, according to Ptolemy. It was fituated S. of Lacobriga, and E. of Pallentia.

SEGLINGE, in *Geography*, a fmall ifland in the Baltic, near the coaft of Finland. N. lat. $60^{\circ} 14'$. E. long. $20^{\circ} 30'$.

SEGLORA, a town of Sweden, in Weft Gothland; 25 miles E. of Gothenburg.

SEGMENT of a Circle, in *Geometry*, a part of a circle, comprehended between an arc and its chord; or, it is a part of a circle comprehended between a right line lefs than a femi-diameter, and part of the circumference.

Thus the portion AFBA (*Plate XIII. Geometry, fig. 13.*) comprehended between the arc AFB and the chord AB, is a fegment of the circle A BFD, &c.; fo is alfo ADBA a fegment comprehended between the arc ADB and the chord AB.

As it is evident every fegment of a circle muft either be greater or lefs than a femicircle, the greater part of the circle cut off by a chord, *i. e.* the part greater than a femicircle, is called the *greater* fegment, as AFB; and the leffer part, or the part lefs than a femicircle, the *leffer* fegment, as ADB, &c.

The angle which the chord AB makes with a tangent LB, is called the *angle of a fegment*. It is demonftrated, that

that the angle included by a tangent to a circle and a chord, drawn from the point of contact is equal to the angle in the alternate segment.

Some also call the two mixed angles comprehended between the two extremes of the chord and the arc, *angles of the segment*; but those are in reality the same with those of the chord and tangent.

SEGMENT, *Angle in the*. See ANGLE.

SEGMENTS, *Similar*. See SIMILAR.

The height of a segment DE, and half its base, or chord, AE, being given, to find the area of the segment. Find the diameter of the circle. On this describe a circle, and draw the base of the segment AB; draw the radii AC, BC; and find the number of degrees of the arc ADB. From the diameter had, and its ratio to the periphery, find the periphery itself; and from the ratio of the periphery to the arc ADB, and the periphery itself, find the length of the arc ADB. This done, find the area of the sector ADBCA; and that of the triangle ACB. Lastly, subtract the triangle from the sector, and the remainder is the area of the segment.

If the area of the greater segment BFA were required, the triangle ACB must be added to the sectors ACF and BCF. For other methods of finding the area of a segment of a circle, we refer to Hutton's *Mensuration*, p. 133, &c.

SEGMENT of a *Sphere*, is a part of a sphere terminated by a portion of its surface, and a plane which cuts it off, passing somewhere out of the centre. This is more properly called a *section of a sphere*.

The base of such a segment, it is evident, is always a circle whose centre is in the axis of the sphere.

The solid content of a segment of a sphere is found, by multiplying the surface of the whole sphere by the altitude of the segment, and then dividing the product by the diameter of the sphere, and to the quotient adding the area of the base of the segment: or, if it be less than a hemisphere, thus; take the altitude of the segment from the radius of the sphere, and by the difference multiply the area of the base of the segment, and subtract this product, from that which will arise by multiplying the semi-axis of the sphere into the convex surface of the segment; then divide the remainder by 3, and the quotient is the solidity sought.

The latter method supposes the axis of the sphere to be given; if not, it may be found thus; let the altitude of the segment be called a , and its semidiameter, s , then will

$a:s::\frac{s^2}{a};$ add $\frac{s^2}{a}$ to a , and that shall give the axis sought.

See FRUSTUM, and SPHERE.

SEGMENT, *Resistance of a*. See RESISTANCE.

SEGMENT is sometimes also extended to the parts of ellipses, and other curvilinear figures.

SEGMENTS, *Line of*. On Gunter's sector there are usually two lines, called *lines of segments*; they are numbered with 5, 6, 7, 8, 9, 10, and lie between the lines of sines, and those of superficies. They represent the diameter of a circle, so divided into one hundred parts, as that a right line drawn through those parts, and normal to the diameter, shall cut the circle into two segments, of which the greater shall have that proportion to the whole circle, which the parts cut have to one hundred.

SEGMENT-*Leaves*, a denomination given by botanists to those leaves that are cut and divided into many shreds, or slices, as fennel, &c.

SEGMENTUM, among the Romans, an ornament of lace used by the women on their shoulders, which, according to some, resembled our shoulder-knots.

Segmenta were likewise a kind of tessellated or Mosaic

pavements, made up of pieces of various shapes and colours, but which had an uniform and regular arrangement.

SEGMOIDAL VALVES, in *Anatomy*, are little valves of the pulmonary artery; thus called from their resembling segments of circles, but more usually called *semilunar valves*.

SEGNA, in *Geography*, a sea-port town of Morlachia, on the coast of the Adriatic, declared a free port, and erected into a bishopric by the emperor Joseph II., in the year 1785. It is a free town, under the protection of Austria. The city is ill built, worse paved, and weakly fortified. It lies on the brink of the sea, on a foundation of concreted ground, at the mouth of a narrow valley, surrounded by marble hills. Segna is supposed to have been formerly situated almost three miles farther from the valley, on a spot where are found traces of ancient habitations and funeral monuments. The sea seems to have covered the bottom of the valley as far as the city, which stood on the side of a hill, and formed a tolerable harbour. The walls of this city were not constructed before the 16th century; and this, together with other circumstances, affords a further proof that Segna does not occupy the site of the ancient Senia. The wind from the mountains sometimes blows with such violence, that it is dangerous in winter to encounter it in the street. Horses loaded with salt are frequently thrown down in the market-place of Segna; and the roofs of houses, though covered with heavy stones, are removed. When hurricanes occur, the ships that happen to be in the harbour run the greatest risk of being lost; nor are they preserved without great labour and expence. The sea in the mouth of the channel of Segna, opposite to the valley, is hardly ever calm; but notwithstanding all these perils and disasters, the inhabitants had, about the beginning of the last century, fifty merchant-ships at sea; and they acquired wealth by exporting the corn, wood, wax, honey, tar, and iron of the Turkish state, on which they border, as well as the timber felled in the ancient forests of Vilebich; and by importing, besides many other articles of merchandize, salt, oil, and wine, for the supply of the interior provinces. At length, however, the inconvenience of their situation disconcerted their marine and commercial enterprises, so that at present Segna has but few ships belonging to it. Another damage was sustained by this city, in consequence of the regulation made by the court of Vienna in 1741, which deprived it of 60,000 florins a-year in money, 40,000 ells of cloth, and 20,000 measures of grain, given yearly by the emperor to the inhabitants of Segna, who were a warlike people, and formed a kind of barrier against the Turks on that side. When the Austrians took the country of Lika from the Turks, and formed all the inhabitants into militia, Segna lost its importance. The soil is so unproductive, that, with the utmost labour, it supplies scarcely provisions sufficient for two months in the year; and they are under a necessity of procuring water from a spring at the distance of twelve miles. The population of Segna is at present computed at less than 7000; and yet the people, amidst all their disadvantages, manifest a civility and politeness of manners, which are not met with in any other place of the Austrian coast, nor even among the Venetian subjects of these parts. N. lat. $45^{\circ} 4'$. E. long. $15^{\circ} 3'$.

SEGNI, BERNARDO, in *Biography*, an early Italian historian and man of letters, was born at Florence about the close of the 15th century. He was educated at Padua, where he pursued with great assiduity the study of the Latin and Greek languages. He then engaged in legal pursuits, which were interrupted by a commission from his father to manage some commercial business at Aquila. Re-

turning to Florence, he was employed in public affairs by the republic, and by duke Cosmo, who in 1541 sent him on an embassy to Ferdinand, king of the Romans. He was, in 1542, appointed consul of the university of Florence, then in very high reputation. He wrote a history of Florence from the year 1527 to 1555, which in every respect is considered as one of the best productions of the age. It was seen by no one during his life, and was not printed till the year 1713, when it appeared, together with a life of Niccolò Capponi, gonfalonier of Florence, Segni's uncle. This writer likewise translated into the Italian language several treatises of Aristotle, which were printed at Florence in 1549—50. He died in 1559.

SEGI, in *Geography*, a town of the Campagna di Roma, the see of a bishop, under the pope. Organs are said to have been invented in this town; 25 miles S.E. of Rome.

SEGI, in *Ancient Geography*, a people of Gaul, who are supposed to have occupied a territory, which is the site of a small town, called "Sinei," or "Signei," on the frontier of Namur, and to have founded it.

SEGNITZ, in *Geography*, a town of the duchy of Wurzburg, on the Maine; 12 miles S.E. of Wurzburg.—Alfo, a town of Germany, in the principality of Anspach; 4 miles S.W. of Maynbernheim.

SEGO, Ital., in *Music*, a sign or mark of reference, for the repetition of any strain, or portion of a strain. It is usually an S, the initial of *signum* or *segno*, dotted on each side, thus ♯; of more use in rondeaux than in any other movements. The sharp ♯, natural ♮, and flat ♭, are *accidental signs*, as is the diesis x', or double sharp. The pause, or corona ☉, is a *segno di silentio*, as well as a final terminating sign. (See all these terms under their several heads.) The ♯ is likewise used in canons and catches written on one line, to mark the places where the several parts come in.

SEGO, in *Geography*, a city of Africa, and capital of the kingdom of Bambara, situated on the Joliba or Niger. Mr. Park, whose death we have now reason to lament, arrived at this city in his first African expedition; and to him we are indebted for the following account of it. He says, that it consists, properly speaking, of four divisions or quarters, two on each side of the water, and each of them surrounded by a mud wall; so that they exhibited the appearance of four distinct towns. The two divisions on the north side of the river are called "Sego Korro" and "Sego Boo;" and those on the south bank are called "Sego Soo Korro" and "Sego See Korro." The houses are built of clay, and have flat roofs; but some of them have two stories, and many are white-washed. Besides these buildings, Moorish mosques are seen in every quarter. These objects, with the numerous boats on the river, a crowded population, and the cultivated state of the surrounding country, formed altogether a prospect of civilization and magnificence, which our traveller little expected to find in the bosom of Africa. From the best inquiries he could make, he had reason to believe, that Sego contained altogether about 30,000 inhabitants. The king of Bambara constantly resides in the largest quarter of the city, called Segu See Korro: he employs a great many slaves in conveying people over the river; and the money thus obtained, though the fare is only ten cowries for each person, furnishes a considerable annual revenue to the king. The boats on the Niger are of a singular construction, each of them being formed of the trunks of two large trees, rendered concave, and joined together, not side by side, but lengthways; the junction being exactly across the middle of the boat. They are, therefore,

very long, and disproportionately narrow; for Mr. Park observed in one of them four horses and a great many people, crossing from a ferry. It was at a village near this city that Mr. Park was ordered by the king to take up his abode; but the inhabitants being indisposed, either from aversion or from fear, to accommodate him with lodging and entertainment, he was under a necessity of sheltering himself, in a storm of thunder and rain, under a tree. For an account of the hospitable treatment he received on this occasion from a poor Negro woman, see the article AFRICA. When he received, on the third day of his abode, an order from the king to depart from the vicinity of Segu, Manseng (the king) wishing to relieve a white man in distress, sent him 5000 cowries, to enable him to purchase provisions in the course of his journey. The messenger added, that if Park's intentions were to proceed to Jenné, he had orders to accompany him as a guide to Sansanhang. Segu is situated in N. lat. 14° 10' 30". W. long. 2° 26'.

SEGOBRIGA, in *Ancient Geography*. See SEGORBE. SEGODUNUM, a town of Gallia Celtica, belonging to the people called "Rutani," or "Ruteni," according to Ptolemy. In the Peutingerian Tables, it is called "Segodum;" and it afterwards took the name of "Rutena," or "Ruteni," and at length that of Rhodéz.

SEGOLTA REX, one of the Hebrew accents, usually answering to our semicolon, and marked with three points over a letter, thus (···) or (··)

SEGONTIA, in *Ancient Geography*, a town of Spain, in the Tarragonensis, upon the route from Emerita to Sargossa, between Cafada and Arcobrega, according to the Itinerary of Antonine.

SEGONTIA Paramica, a town of Spain, in the Tarragonensis, belonging to the people called "Varduli."

SEGONTIACI, a people of the isle of Albion, who inhabited with the Trinobantes, and were of the number of those who submitted to Cæsar.

SEGOZAC, in *Geography*, a town of France, in the department of the Charente, and chief place of a canton, in the district of Cognac; 6 miles S.E. of Cognac. The place contains 2549, and the canton 12,386 inhabitants, on a territory of 222½ kilometres, in 19 communes.

SEGOR, in *Ancient Geography*, a town of Palestine, in the Pentapolis, at the southern extremity of the Dead sea. It escaped the destruction of the four other towns of the Pentapolis. Its first name was "Bala;" but Lot having obtained permission to flee from Sodom, called it Segor, or the little town.

SEGORBE, in *Geography*, a town of Spain, in the province of Valencia, with the title of duchy, agreeably situated in a very fertile vale, abounding in grain and in fruit, on a river of the same name, which there takes that of Murviedro or Morviedro. Its population consists of 1200 families, or about 6000 souls. Some people relying on the similarity of names, pretend that this is the ancient "Segobriga," which we find on many Roman medals; others, on the contrary, place that ancient town in Castile; and others in Aragon. Segorbe is the see of a bishop, suffragan to Valencia, the diocese of which comprehends 42 parishes. The clergy of its cathedral are composed of four dignitaries, ten canons, twenty-four beneficiaries, and thirty-three chaplains. The town has four convents of monks, a convent of nuns, a seminary, a hospital, five hermitages, oratories or chapels; a provisor, who is at once official and vicar-general of the diocese; nine gates, and six squares. It abounds in fountains, three of which are public, and about forty in private houses. It was taken from the Moors in 1245, by James I., king of Aragon.

The cathedral church has some paintings of the school of Joannez, and of that of Ribalta. The church of the convent of nuns is of good architecture, and has some good paintings. The seminary is kept in the ancient house of the Jesuits. Antonio Ximen, a poet in the commencement of the 16th century, and Juan Valero, a theologian of the beginning of the 17th century, were born in this town. At a quarter of a league from Segorbe stands the Carthusian monastery of Vel de Christo, founded by the infant don Martin, son and successor of Peter IV., king of Aragon. Here are some good paintings by Vergara, Camaron, Danoso, Joannez, and Orrante. The monks have established a paper manufactory at Altura, a village of about 1500 inhabitants, which belongs to them, and which is at a quarter of a league's distance between their monastery and Segorbe. N. lat. $39^{\circ} 58'$. W. long. $0^{\circ} 39'$.

SEGORTIALACTA, in *Ancient Geography*, a town of Spain, in the Tarragonensis, which belonged to the Arevacz. Ptolemy.

SEGOSA, a town of Gaul, marked in the Itinerary of Antonine between Aqs and Bourdeaux. It is now the place called "Esfouffé."

SEGOSTAEVO, in *Geography*, a town of Russia, in the government of Kolivan; 44 miles W. of Krasnoiarisk.

SEGOVELLAUNI, or SEGALAUNI, in *Ancient Geography*, a people of the interior of Gallia Narbonensis, in the vicinity of the Rhone. Pliny.

SEGOVIA, a town of Hither Spain, south of Cauca; famous for its aqueduct, said to have been constructed in the time of Trajan.

SEGOVIA, in *Geography*, a town of Spain, in Old Castile, which in the arrangement of its buildings exhibits the figure of a ship, with the stern to the east, and the prow to the west, commanding an immense rock, and appearing buried between two deep vallies, one lying to the north, and the other to the south. The first is watered by a stream, called Clamares, which forms a junction with the Erosma, that waters the last, on which are five handsome bridges. This river, whose banks are clothed with wood, formerly bore the name of Areva, whence the appellation of Arevaci was given to the inhabitants of these vallies. The city is surrounded with walls; and a range of towers, at equal distances, is planted on the ramparts. The number of houses has been estimated at 5000, but the population does not exceed 10,000 souls. The streets are almost all narrow and crooked, and irregularly paved. The four suburbs are on more even ground, and contain several manufactories. Segovia is the see of a bishop, suffragan of the archbishop of Toledo, whose diocese includes the cathedral chapter of Segovia, the collegiate chapter of St. Ildefonso, and 438 parishes. The cathedral chapter is composed of 8 dignities, 37 canons, 7 prebends, and 19 sub-prebends; and besides these, 23 chaplains are attached to the church. In Segovia are reckoned 24 parishes, a chapel of ease, and 21 convents for both sexes. This city is the residence of the intendant of the district, which assumes its name; and under the superintendence of a corregidor, an alcade, and a fixed number of regidores. Here are a statistical society, the members of which assume the title of "friends of the country;" and a military school, destined for the instruction of young engineers. Segovia was once a commercial and opulent town, eminently distinguished for its cloth and woollen manufactures; and it has been calculated, that 44,100 quintals of wool were consumed in the looms of this town, and that 34,199 persons were employed by them; but its manufactures and trade declined, so that, in the 18th century, the fabrication of stuffs and cloths employed

no more than 120 looms, in which only 4318 quintals of washed wool were consumed. Between 40 and 50 years ago, this manufacture revived; and in 1790 there was an addition of 63 looms, which employed 800 or 900 quintals of wool, and afforded occupation to 2400 manufacturers. This city has still a manufactory of delf-ware, but it is of little importance. Among its public edifices we may reckon the mint, producing at present only copper, which is a handsome building, constructed in the 15th century by Henry IV., and in part re-edified by Philip II.: its operations are carried on by hydraulic machines;—the convent of the Capuchins, with a subterraneous chapel;—the convent of the Carmelites;—the town-house, the front of which has two compartments, with simple Doric pillars, arranged in double rows, and on each side a tower supported on a piazza by ten columns;—the church of the Jeronimites of Parral;—the cathedral church, which presents a mixture of Gothic and Grecian architecture, though constructed in the 16th century, with the principal altar of marble, and having in the middle a silver statue of the Virgin, and several other ornaments;—and the alcazar, formerly the residence of the Castilian kings, bearing the characters of venerable antiquity, where Alphonso the Wise composed his astronomical tables, and in which are apartments fretted with mosaic work, still fresh; and a series of 52 statues of painted wood, and each bearing an appropriate inscription. The noblest monument of Segovia is its aqueduct, which has been referred by some writers to a very remote antiquity, and ascribed to the architects who built the Egyptian temple of Serapis; but which much more probably originated with the Romans, at an unascertained period, but perhaps with the authority of Licinius, Larcus, or Trajan. The materials are of rough free-stone. It commences at a large stone basin, (about 50 paces from the town,) from whence it receives the water, which it conveys through an open canal towards the south. At its origin the fabric is erected on a long range of 75 arches, of which the first is 14 feet 6 inches in height; the last, which is at the convent of St. Francisco, is 33 feet 6 inches. At this point begins a double row of arches, supported one over the other, which run in the direction of east and west, and cross the valley and the place of Azoquejo; of these the greatest elevation is 80 feet 10 inches. The whole range comprehends 159 arches, supported on pilasters, most of which measure 6 feet 11 inches in the front surface, and 9 feet 4 inches on the interior side. The aqueduct terminates at the alcazar, after having distributed the greater part of the water through different quarters of the town. In modern times, this noble work of Roman architecture has been disfigured by the erection of several houses on its pilasters, a disposition highly injurious to the majesty of the original edifice. It is built of square stones, which are placed one on the other, without any appearance of cement. Segovia was the native place of Alphonso de Ledesma, a good poet, who flourished at the commencement of the last century; of Domenico Soto, the son of a gardener, who published an essay "De Justitia et Jure," two books "De Naturâ et Gratiâ," and Commentaries on St. Paul's Epistle to the Romans. At Segovia was also born the Jesuit Francis Ribera, who died at Salamanca in 1591, well known for the erudition and acumen displayed in his Commentaries on the minor prophets. Segovia is distant 46 miles N.N.W. of Madrid. N. lat. $41^{\circ} 3'$. W. long. $4^{\circ} 1'$.

SEGOVIA, *Nueva*, a town of the island of Luçon, founded in 1598, the see of a bishop, defended by a fort and a garrison; situated near the N. coast of the island; 250 miles N. of Manilla.—Also, a town of Mexico, in the province

vince of Nicaragua; 70 miles N.N.E. of Leon. N. lat. $13^{\circ} 30'$. W. long. $89^{\circ} 56'$.—Also, a town of South America, in the government of Caraccas, and province of Venezuela, founded by the Spaniards in 1552; 130 miles S.W. of Caraccas. N. lat. $8^{\circ} 50'$. W. long. $68^{\circ} 16'$.

SEGOVIA, *Nueva*, or *Tare*, a river of Mexico, in the province of Costa Rica, which runs into the Spanish Main, N. lat. $13^{\circ} 10'$. W. long. $83^{\circ} 5'$.

SEGRA, a river of Spain, which rises in the N. part of Catalonia, and joins the Ebro, on the borders of Aragon, near Mequinez.

SEGRAIS, JOHN REGNAULT DE, in *Biography*, a man of letters, was born of a good family at Caen, in 1624. He was intended for the church, but a courtier, charmed with the sprightliness of his conversation, carried him to Paris when he was about twenty years of age, and placed him with Mademoiselle de Montpensier, who first gave him the title of her almoner in ordinary, and then of her gentleman in ordinary. He became known to the literary world by his lyric and pastoral poetry, and in 1656 he published a collection of pieces of this kind, together with some little stories called “*Nouvelles Françoises*,” by which he obtained considerable reputation. He was thought to have been particularly happy in his Eclogues, in which he attempted to unite elegance with the simplicity appropriate to his subject. He aimed at a higher strain in his metrical translation of Virgil’s *Æneid*, which was well received by the public, though it was not free from faults, which were heavy drawbacks on its merit. The reputation of Segrais gave him admission, in the year 1662, into the French Academy. In 1672 he quitted Mademoiselle de Montpensier, and was domesticated with Madame de la Fayette, whom he assisted with his advice and correction in the composition of her romance of “*Zayde*,” and he engaged his friend the learned Huet to prefix to it his Dissertation on Romances. He at length retired to his native city, and married a rich heiress, who was his cousin. Being now at his ease, and somewhat incommoded with deafness, he declined engaging in the education of the duke of Maine, observing that experience had taught him that at court both good eyes and good ears are requisite. He collected the dispersed members of the academy of Caen, and gave them an apartment to meet in. He died in 1701, at the age of 76. After his death, there appeared his translation of Virgil’s “*Georgics*,” and a miscellany of anecdotes and literary opinions.

SEGRE', in *Geography*, a town of France, and principal place of a district, in the department of the Maine and Loire; 18 miles N.W. of Angers. The place contains 558, and the canton 9247 inhabitants, on a territory of 205 kilometres, in 15 communes.

SEGREANT, a term used in *Heraldry* for a griffon, when drawn in a leaping posture, and displaying his wings, as if ready to fly.

SEGREGATA, POLYGAMIA, in *Botany*, the last order of the class *Syngenesia*, in which the flowers are doubly compound, each floret, or assemblage of florets, having a partial calyx.

SEGRO, in *Geography*, a town of Naples, in Capitanata; 10 miles N.E. of Manfredonia.

SEGS, in *Rural Economy*, provincially the name applied to sedges, or sedge-grafs.

SEGSTADT, in *Geography*, a town of the duchy of Wurzburg; 5 miles E. of Hasfurt.

SEGUATANEIO. See CHEQUETAN.

SEGUE, in *Italian Music*, is often found before *aria*, *coro*, *allelujah*, *amen*, &c. to acquaint performers that such movements immediately follow the last bar of the preceding

piece, over or after which such notice is written. But if the words *si piace*, or *ad libitum*, are added, they imply that such movements may be performed or not, at pleasure.

SEGUENZA, Ital. in *Ecclesiastical Music*, is a kind of hymn sung in the Roman church, generally in prose. The seguenze are generally sung after the Gradual, immediately before the Gospels, and sometimes in the vespers before the Magnificat. They were formerly more used than at present. The Romish church has retained three seguenze, called by the Italians, *li tre seguenze dell' anno*: which are, “*Lauda Sion salvatorem*,” &c.; “*Vittima paschali laudes*,” &c. “*Veni Sancte Spiritus*.” These are sung, in many places, to figurative music. There is also one beginning “*Dies iræ, dies ille*,” in the funeral service, which has been admirably set by all the great composers à cappella of Italy, and among the Catholics of Germany.

SEGUIERIA, in *Botany*, named by Linnæus in honour of his friend and correspondent John Francis Seguer, secretary to the Academy of Sciences at Nîmes, in Languedoc, who was the author of an excellent and original work, entitled *Plante Veronenses*, published in two volumes octavo, in the year 1745, and to which a third supplementary volume was added in 1754. Seguer died in 1784.—Loefl. It. 191. Linn. Gen. 272. Schreb. 364. Jacq. Amer. 176. Willd. Sp. Pl. v. 2. 1219. Mart. Mill. Dict. v. 4. Juss. 440. Lamarck Dict. v. 7. 52. Loureir. Cochinch. 341.—Class and order, *Polyandria Monogynia*. Nat. Ord. uncertain.

Gen. Ch. *Cal.* Perianth inferior, spreading, permanent, of five, oblong, coloured, concave leaves. *Cor.* none. *Stam.* Filaments numerous, capillary, spreading, longer than the calyx; anthers oblong, flattish. *Pist.* Germen superior, oblong, compressed, membranous at the top, thicker on one side; style very short, at the thicker side of the germen; stigma simple. *Peric.* Capsule oblong, augmented by a very large wing, thicker on the straight side, with three smaller wings on each side at the base, of one cell, not gaping. *Seed* solitary, oblong, smooth.

Eff. Ch. Calyx of five leaves. Corolla none. Capsule terminated by a large wing, and furnished with smaller lateral wings. *Seed* solitary.

1. *S. americana*. American Seguieria. Linn. Sp. Pl. 747. Jacq. Amer. 170. “*Pict. t. 82*.”—Stem climbing, prickly. Leaves lanceolate, emarginate. Clusters branched, leafy.—Native of South America, especially in woods and coppices about Carthagea, flowering in September. The stem of this shrub is generally twelve feet in height, with very long, round, green shining branches, by which it is supported. Leaves alternate, stalked, ovate, entire, shining, with recurved prickles. Flowers in terminal clusters, whitish, smelling disagreeably. The unripe fruit is said to resemble that of *Securidaca*.

2. *S. asiatica*. Asiatic Seguieria. Loureir. Cochinch. 341.—Stem climbing, without prickles. Leaves ovate, entire. Clusters long, axillary, terminal.—Native of woods in Cochinchina. Stem shrubby, branched, round, long, tough. Leaves alternate, on short stalks, rough. Flowers in long terminal clusters, whitish-green, scentless.

SEGUIN ISLAND, in *Geography*, a small island on the coast of Maine, in Casco bay.

SEGULAM, one of the Fox islands, in the North Pacific ocean. N. lat. $53^{\circ} 35'$. E. long. $187^{\circ} 50'$.

SEGUNTIA CELTIBERUM, in *Ancient Geography*, a town of Spain, in Celtiberia. Livy.

SEGUR, in *Geography*, a town of France, in the department of the Correze; 12 miles W. of Uzerche.—Also, a town of France, in the department of the Aveyron; 12 miles E.S.E. of Rhodéz.

SEGURA,

SEGURA, a town of Spain, in the kingdom of Aragon; 23 miles S.E. of Daroca.—**Alfo**, a river of Spain, which rises in the mountains of Murcia, 10 miles S.S.E. from Segura de la Sierra, traverses the province of Murcia, and the south part of Valencia, and runs into the Mediterranean, 16 miles S.S.W. of Alicante.—**Alfo**, a town of Spain, in Guipuscoa; 18 miles S.S.W. of St. Sebastian.—**Alfo**, a town of Portugal, in the province of Beira, near the frontiers of Spain; 6 miles N. of Rosmarilhal.—**Alfo**, a town of Spain, in Extremadura; 25 miles S.E. of Xeres de los Caballeros.

SEGURA de la Frontera, a town of Mexico, in the province of Tlaxcala, built by Cortes; 50 miles S. of Tlaxcala.

SEGURA de la Sierra, a town of Spain, in Murcia; 60 miles S.W. of Chinchilla.

SEGUS, a town of France, in the department of the Upper Pyrenees; 4 miles N. of Argeliez.

SEGUS, in *Ancient Geography*, a river of Germany, the banks of which were inhabited by the Sicambri, according to Cæsar and Tacitus.

SEGUSIANI, the inhabitants of Segusio. Their country, in Cisalpine Transpadane Gaul, towards the sources of the Duria Minor, formed a small state, of which Cottius was the only king upon record. This prince retired to the mountains, and escaped subjection to the Roman yoke by his obscurity. But he sought security in an alliance with the Romans, and with this view he flattered Augustus by assuming the name of Julius Cottius. He made many efforts for rendering the passage of the Alps practicable in that part which he occupied. Claudius, upon augmenting his small territory, gave him the name of king. After his death, Nero united this country to the empire; but the memory of Cottius was long respected in the country which he governed. In the time of Ammianus Marcellinus, that is, about the year 370 of our era, the tomb of Cottius was shewn at Segua. One part of the Alps took its name, "Cottian," from him.

SEGUSIANI, or *Secusiani*, a people of Gallia Celtica, or Lyonnensis. To the N. were the Cædui and Sequani, to the E. and N. the Allobroges, and to the W. the Averni. Pliny says, that these people were dependent on the Cædui in the time of Cæsar; but that they rendered themselves independent under the empire of Augustus.

SEGUSIO, **SUZE**, a town formerly not inconsiderable, in Transpadane Gaul, among the mountains, on Duria Minor. Under the Romans it obtained the title of municipal. In later times, its rulers were designated by the title of marquis. At present it is comprehended in Piedmont. Among other things found in this place is the triumphal arch on which were inscribed the appellations of the people who were subject to Cottius in the time of Augustus. See **SEGUSIANI**.

SEGUSTERO, **SISTERON**, a town of Gallia Narbonensis. From its Celtic name we are led to presume that it existed, or at least that its territory was inhabited, before the Romans came into Provence. Some have thought that this town depended on the Avantici.

SEGWAH, in *Geography*, a town of Hindoostan, in Baglana; 20 miles S.S.E. of Damaun.

SEHALOUR, a town of Hindoostan, in Mysore; 36 miles N. of Seringapatam.

SEHAN, a town of Arabia, in Yemen; 3 miles W.N.W. of Doran.

SEHAURUNPOUR, a town of Hindoostan, and capital of a circar, to which it gives name, between the Jumnah and the Ganges, in the subah of Delhi; 86 miles N.

of Delhi. N. lat. $30^{\circ} 4'$. E. long. $77^{\circ} 15'$.—**Alfo**, a circar or province of Hindoostan, in the subah of Delhi, bounded on the N. by mountains, which separate it from Thibet, on the E. by the Ganges, which divides it from Sumbul, on the S. by the district of Delhi, and on the W. by Sirhind, from which it is divided by the river Jumnah. Its chief towns are Sehaurunpour, Merett, and Hurdwar. It is about 90 miles from E. to W., and nearly the same from N. to S.

SEHESTEN, a town of Prussia, in the province of Natangen; 54 miles S.E. of Königsberg.

SEHIMA, in *Botany*, so called by Forskal, from its Arabic name; a genus of that author's, separated from *Ischemum*, but apparently without sufficient reason.

SEHIRMAN, in *Geography*, a mountain of Arabia, in the province of Yemen; 8 miles S. of Kataba.

SEHWAN, a town of Sewestan, on the Sinde; 66 miles N.E. of Nusserpour. N. lat. $26^{\circ} 5'$. E. long. $69^{\circ} 16'$.

SEIAL, a town of Persia, in the province of Adirbeizan; 50 miles S.E. of Ardebil.

SEJANT is a term used in *Heraldry*, when a lion, or other beast, is drawn in an escutcheon, sitting like a cat, with his fore-feet straight.

SEJANUS, **ÆLIUS**, in *Biography*, celebrated in the history of Rome for the tyranny of his administration, was a native of Vulturni, in Etruria. His father, Seius Strabo, a Roman knight, was commander of the prætorian guards in the reigns of Augustus and Tiberius. Ælius, when young, attached himself to Caius Cæsar, the grandson of Augustus. After the death of that prince, and of Augustus, he was associated with his father in his command, by Tiberius, with whom he rose to great favour, and was appointed governor to young Drusus. When the theatre of Pompey was destroyed by fire, the emperor, at the time that he declared his intention of rebuilding it, pronounced an eulogy on Sejanus before the senate, on which that servile body decreed him a statue, to be placed in the new edifice. Having by his artifices and dissimulation obtained a complete ascendancy over the mind of Tiberius, he applied himself to strengthen the fabric of his power, and pave the way to higher honours. With this view he ingratiated himself as much as possible with the prætorian guards, and he created a great personal interest in the senate, by means of his recommendations to lucrative places, and he is said to have secured the wives of many men of high rank by secret promises of marriage. The imperial family being, as he thought, a considerable obstacle to his projects of ambition, he determined upon their destruction; and beginning with Drusus, the son of the emperor, who had manifested a jealousy of his influence, he entered into a criminal intrigue with his wife Livia, the sister of Germanicus, by means of whom he was supposed to have caused a slow poison to be administered to that prince, which occasioned his death. He next endeavoured to persuade Tiberius to quit Rome, and retire to a life of repose, that the whole care of government might devolve upon himself, and that nothing should reach the emperor's ears but through a channel subject to his controul. This he effected in the twelfth year of Tiberius's reign, and from that moment Sejanus was master of Rome. The dislike manifested by the emperor to the widow and family of Germanicus was inflamed by the minister, till his persecution of them ended in the banishment and death of Agrippina and her two sons. Every kind of homage was now paid to the minister, Rome was crowded with his statues, and the senators all vied with each other in adulation of the favourite. At length Tiberius began to be suspicious of his designs,

but for a time he concealed his suspicions in his own breast, and even while under the fear of danger, he conferred upon his minister additional marks of his favour, making him his colleague in the consulship. He however gradually withdrew from him the tokens of his confidence, and finding that the symptoms of this change had greatly diminished the crowds that attended his levees, he proceeded, though with much caution, to the measures for his destruction. He now appointed another commander of his prætorians. Sejanus, knowing the extent of his own guilt, began to be alarmed: he called together his friends and followers, and held forth to them the most flattering promises, and having increased the number of his partisans, formed a bold conspiracy, resolved by any means to seize the sovereign power. A powerful league was formed with astonishing rapidity, and great numbers of all descriptions, senators as well as military men, entered into the plot. Among these, Satrius Secundus was the confidential friend and prime agent of the minister, who, for reasons that are not known, resolved to betray his master. For this purpose he addressed himself to Antonia, the daughter of Antony the triumvir, the widow of Drusus, and the mother of Germanicus. When this illustrious woman, who was highly esteemed by the people, as well as honoured by the court, heard the particulars, she sent dispatches to the emperor by one of her slaves. Tiberius was astonished, but not at all dismayed: the danger pressed, and he determined to take decisive measures. He sent Macro to Rome with a special commission, and giving him ample powers that might be adapted to all emergencies. Early in the morning of the 15th, before the kalends of November, a report was spread, that letters had arrived at Rome, with the view of augmenting still farther the honours of Sejanus. The senate was summoned to meet in the temple of Apollo, near the imperial palace. Sejanus attended without delay, and a party of prætorians followed him. Macro met him in the vestibule of the temple. He approached the minister with all demonstrations of profound respect, and taking him aside, told him not to be surprised that he had not received a letter from the emperor himself, but, says he, I am this day to deliver the emperor's orders. Sejanus, elated with joy, expecting some unlooked-for dignity, entered into the senate-house, and Macro followed. He opened his commission by reading a long letter in the senate to the consuls from Tiberius, which concluded with an order to seize his person; instantly the whole assembly loaded with insults and reproaches the man at whose feet they lately bent, and the people began to throw down and treat with every indignity the statues before which they had been accustomed to offer sacrifices. His person was seized, and thrown into prison, and being accused of high treason, he was condemned without a single defender. On the same day he was executed, and his body thrown into the Tiber. A massacre of his relations took place, and even his infant children were inhumanly slaughtered. This catastrophe took place in the year 31 of the Christian era, and it furnished to Juvenal a fine instance of the mutability of fortune, of which he took advantage in his tenth satire.

SEIBERSHOLZ, in *Geography*, a town of Bavaria, in the principality of Aichstatt; 3 miles N. of Aichstatt.

SEIBERSTORF, a town of Austria; 8 miles N.E. of Ebenfurth.

SEIBO, or **ZEYBO**, a town of the island of Hispaniola; 50 miles E.N.E. of St. Domingo.

SEIBOUSE, a river of Algiers, which runs into the Mediterranean, near Bona.

SEICHES, a town of France, in the department of the Lot and Garonne, and chief place of a canton, in the dis-

trict of Marmande; six miles N.E. of Marmande. The place contains 1351, and the canton 13,546 inhabitants, on a territory of 230 kilometres, in 20 communes.—Also, a town of France, in the department of the Maine and Loire, and chief place of a canton, in the district of Bauge; nine miles W. of Bauge. The place contains 1364, and the canton 9906 inhabitants, on a territory of 240 kilometres, in 13 communes.

SEID GENDER, a town of Persia, in the province of Laristan; 25 miles N. of Lar.

SEIDE. See **SAIDA**.

SEIDENBACH, a town of Germany, in the principality of Culmbach; 9 miles W.S.W. of Bayreuth.

SEIDENBERG, a town of Lusatia, in which are manufactures of cloth and knit stockings; 8 miles S.S.E. of Gorlitz.

SEIDENSCHWANZ, a town of Bohemia, in the circle of Boleflau; 8 miles N. of Turnau.

SEIDENSTETTEN, or **SEITTENSTETTIN**, a town of Austria; 9 miles N.N.W. of Waidhoven.

SEIFERSDORF, a town of Bohemia, in the circle of Boleflau; 5 miles S. of Krottaw.

SEIGH, a town of Hindoostan, in Bahar; 15 miles S. of Bahar.

SEIGHN, a town of Hindoostan, in Bahar; 31 miles N. of Hagypour.

SEIGN, a fortress of Dalmatia, in the territory of Spalatro; 16 miles N.E. of Spalatro.

SEIGNELAY, a town of France, in the department of the Yonne; 6 miles N. of Auxerre.

SEIGNEUR, or **SEIGNOR**, *Lord*. See **SIRE**, **SIEUR**, **MONSEIGNEUR**, **LORD**, &c.

SEIGNIORY, **DOMINIUM**, in our *Law*, is used for a manor or lordship.

SEIGNORAGE, or **SEIGNOURAGE**, a right or due belonging to a seigneur, or lord.

SEIGNORAGE is particularly used for a duty belonging to the prince for the coining of money, called also *coinage*, (which see), and in the baser Latin *monetarium*. See **REMEDY for the Master of the Mint**.

This duty is not always the same, but changes according to the pleasure of the prince, and the occasions of state. It is in some measure for the discharge of this duty that alloy was invented; that is, the mixture of other metals with gold and silver.

Under our ancient kings, for every pound of gold brought in the mints to be coined, the king's duty was five shillings; one shilling, and sometimes eighteen pence, of which went to the master of the mint. Under Edward III. the seignorage of every pound weight of silver was eighteen pennyweight, which was then equivalent to a shilling. Under Henry V. the king's seignorage for every pound of silver was fifteen pence. At present, the king claims no seignorage at all, but the subject has his money coined at the public expence; nor has the king any advantage from it, but what he has by the alloy.

In France, under Philip Augustus, the seignorage was one-third of the profit made by coining; St. Louis fixed it at one-sixteenth part of the value of the money coined: king John, at three livres the mark of gold: Charles VII. by reason of the distressed state of his finances, raised it to three-fourths of the value; Louis XIII. fixed it at six livres the mark, or eight ounces of gold, and ten sols the mark of silver. Louis XIV. took away the right of seignorage in 1679, though it was re-established in 1689, on the foot of seven livres ten sols the mark of gold, and twelve sols six deniers the mark of silver.

It must be observed, that for the levying of this duty of feignorage, the just value of the money is augmented by the value of the duty.

SEIHAN DAG, in *Geography*, a mountain of Turkish Armenia; 36 miles S.S.E. of Erzerum.

SEIHOUN, a river of Caramania, which runs into the Adana, at Podendo.

SEJIAT, a town of Asiatic Turkey, in the province of Diarbekir; 6 miles N.E. of Diarbekir.

SEIKS. See SIKHS.

SEIL, a small island near the W. coast of Scotland. N. lat. $56^{\circ} 19'$. W. long. $5^{\circ} 37'$.

SEILA. See ZEILA.

SEILAND, a small island in the North sea, near the coast of Norway. N. lat. $70^{\circ} 20'$.

SEILHAC, a town of France, in the department of the Correze, and chief place of a canton, in the district of Tulle; 6 miles N.W. of Tulle. The place contains 1271, and the canton 11,355 inhabitants, on a territory of $237\frac{1}{2}$ kilometres, in 9 communes.

SEILLAN, a town of France, in the department of the Var; 10 miles N.E. of Draguignan.

SEILLE, LA, a river of France, which runs into the Saône, 4 miles S.W. of Cuifery, in the department of the Saône and Loire.—Also, a river of France, which runs into the Scheldt, above Valenciennes.

SEIM, in *Agriculture*, a term used by the farmers of Cornwall to express a certain determinate quantity of sea-fand, which they use as manure to their lands.

They dredge this up on the sea-coasts, and carry it as far towards the lands where it is to be used, as they can by water. At the landing-place the farmers bring a train of horses to receive it; each horse carrying a seim, that is, a sack of it containing thirteen gallons. The land-carriage of this fand, in Cornwall alone, is supposed to cost thirty-two thousand pounds annually; and yet the farmers find abundant encouragement to continue the use of it, because it is so rich a manure.

SEIMAN, in *Geography*, a town of Asiatic Turkey, in Natolia; 48 miles N.N.E. of Alah Sehr.

SEIMARIEH, a town of the Arabian Irak, on the Euphrates; 42 miles W. of Korna.

SEIME, a town of Nubia, which affords good water. N. lat. $22^{\circ} 15'$. E. long. $30^{\circ} 12'$.

SEIMOUR, a river of Hindoostan, which runs into the Jumna, 70 miles below Etayah.

SEIN, a small island near the coast of France, in the department of the Finistère, the coasts of which are dangerous on account of its rocks and shallows; 28 miles S.S.E. of Ushant. N. lat. $48^{\circ} 2'$. W. long. $42^{\circ} 2'$.

SEINE, LA, a river of France, which rises about two leagues S. of Aignay-le-Duc, in the department of the Côte d'Or, and runs into the English Channel at Havre de Grace.

SEINE, La, a town of France, in the department of the Var, situated on a tongue of land, which runs into the sea; 3 miles S. of Toulon.

SEINE, a department of the northern region of France, formed of the isle of France, situated in $48^{\circ} 50'$ N. lat. containing 24 square leagues, on $452\frac{1}{2}$ kilometres, and 629,763 inhabitants, and divided into three circles or districts, 20 cantons, and 79 communes. The circles are St. Denis, including 36 communes, and 42,984 inhabitants; Sceaux, with 24 communes, and 39,923 inhabitants; and Paris, comprehending 12 cantons, in one commune, and 546,856 inhabitants. The contributions in the 11th year of the French era, were 22,499,486 francs, and the expences charged upon it 1,819,941 francs 34 cents. The capital is Paris. According to Haffenfratz, its length

is six and breadth five French leagues. Its circles are eight, cantons 17, and population 947,472. This department is diversified with plains and eminences; its soil is of various qualities, and in some parts moderately fertile. It abounds with fossils of all kinds, especially in the vicinity of Paris.

SEINE, Lower, a department of the northern region of France, formed of Roumois and the territories of Caux and Bray, and bounded on the N.W. by the English Channel, on the E. by the departments of the Somme and the Oise, and on the S. by the departments of the Eure and the Calvados, from both which it is mostly separated by the river Seine. It is situated in 49° N. lat., and contains $6372\frac{1}{2}$ kilometres, or 207 square leagues, and 642,773 inhabitants. It is divided into five circles, 50 cantons, and 987 communes. The circles are, La Havre, containing 117,735 inhabitants, in 123 communes; Yvetot, with 129,222 inhabitants, in 202 communes; Dieppe, having 106,082 inhabitants, in 222 communes; Neuchatel, with 82,506 inhabitants, in 200 communes; and Rouen, with 207,228 inhabitants, in 200 communes. Its contributions in the year 11, were 9,104,417 fr. and expences 570,526 fr. 33 cents. Its capital is Rouen. According to Haffenfratz, its length is 35 and breadth 30 leagues; its number of circles is seven, and of cantons 64, and its population comprehends 536,400 inhabitants. This department affords abundance of grain, fruits, and pastures.

SEINE and Marne, a department of the same region of France with the former, formed of a portion of French Gatinois, and of Upper and Lower Brie, and bounded on the N. by the departments of the Oise and the Aisne, on the E. by the departments of the Marne and the Aube, on the S.E. by the department of the Yonne, on the S. by that of the Loiret, and on the W. by the departments of the Loiret, and of the Seine and Oise. It contains $6127\frac{1}{2}$ kilometres, or 300 square leagues, and 298,815 inhabitants. It is situated in $48^{\circ} 45'$ N. lat., and is divided into five circles, and 561 communes. The circles are Melun, comprehending 55,830 inhabitants, in 107 communes; Coulommiers, with 49,420 inhabitants, in 80 communes; Meaux, having 88,411 inhabitants, in 164 communes; Fontainebleau, with 57,964 inhabitants, in 104 communes; and Provins, having 47,190 inhabitants, in 106 communes. Its contributions in the 11th year of the French era, were 5,126,616 fr. and expences 307,848 fr. 33 cents. The capital is Melun. According to Haffenfratz, the length of this department is 32, and its breadth 16 French leagues; its number of circles is five, and of cantons 37, and its population is 296,467. This department is diversified with forests, cultivated tracts, and pastures.

SEINE and Oise, a department of the same region of France, consisting of a portion of Vexin-Français, of Hurepoix, of Mantois, &c. and bounded on the N. by the department of the Oise, on the E. by the department of the Seine and Marne, on the S. by that of the Loiret, and on the W. by the departments of the Eure, and of the Eure and Loire. It contains 5880 kilometres, or 286 square leagues, and 429,523 inhabitants. It is situated in $48^{\circ} 30'$ N. lat., and divided into five circles, and 656 communes. The circles are Mantes, including 59,209 inhabitants, in 127 communes; Pontoise, with 91,068 inhabitants, in 165 communes; Versailles, having 163,849 inhabitants, in 195 communes; Corbeil, with 56,507 inhabitants, in 96 communes; and Etampes, with 58,890 inhabitants, in 111 communes. Its contributions in the year 11, were 7,373,685 fr. and its expences 448,928 fr. 62 cents. The capital is Versailles. According to Haffenfratz, the length of this department is 24, and its breadth 18 French leagues.

leagues. Its circles are nine, and cantons 59, and its population 471,612. The soil of the two last circles is moderately fertile, but the others yield abundance of grain, fruits, and pastures.

SEINSHEIM, MARKT, a town of Germany, and capital of a lordship, united to the country of Schwarzenberg; 18 miles S.E. of Würzburg.

SEIONT, a river of North Wales, which runs into the Menai, near Caernarvon.

SEIR, in *Ancient Geography*, the name of mountains which lay to the E. and S. of the Dead sea, appropriated to them before the establishment of the Israelites in the land of promise.—Also, a mountain on the frontier of the tribe of Juda and that of Dan. Josh. iv. 10.

SEISACHTHEIA, Σεσαχθία, in *Antiquity*, a public sacrifice at Athens, in memory of Solon's ordinance, by which the debts of poor people were either entirely remitted, or at least the interest due upon them lessened, and the creditors prevented from seizing upon the persons of their debtors, as had been customary before that time.

The word signifies the shaking off a burden.

SEISENBERG, or SUSONBERG, in *Geography*, a town of Carniola; 11 miles S.E. of Weixelburg.

SEISENSTAIN, a town of Austria, on the Danube; 2 miles N.E. of Ips.

SEISIN, SEISINA, in *Law*, signifies *possession*. In this sense we say, *primer seisin*, for the first possession, &c.

Seisin is twofold, *seisin in fact*, and *seisin in law*. The former is when an actual and corporal possession is taken: and the latter, when something is done, which the law accounted a seisin, as an enrolment.

This in law gives a right to lands and tenements, though the owner be by wrong disseised of them. He who hath an hour's possession quietly taken, hath *seisin de droit*, & *de claime*, of which no man may disseise him by his own force or subtlety, without process of law. See DISSEISIN.

The civilians call the latter *civilem possessionem*, and the former *naturalem*.

SEISIN, *Livery of*. See LIVERY.

SEISINA *habendo, quia rex habuit annum, diem et vastum*, a writ that lies for delivery of *seisin* to the lord of lands or tenements, after the king, in right of his prerogative, hath had the year, day, and waste, on a felony committed.

SEISINAM *habere facias*. See HABERE.

SEISOR. See DISSEISOR.

SEISSAN, in *Geography*, a town of France, in the department of the Gers; 9 miles S. of Auch.

SEISSEN, a town of Saxony, in the circle of Erzgebirg; 18 miles S.S.E. of Freyberg. N. lat. 50° 35'. E. long. 13° 27'.

SEITAN, a name given by Avicenna, and other of the Arabian writers, to a species of prickly tree, often recommended in their prescriptions.

The word is sometimes also written *setan*, *siten*, *setab*, or *seim*.

Pliny mentions this as a wood remarkably durable. He says it grew most plentifully in Egypt, and that it remained uncorrupted in waters. It is called by him, and others of the old Latin writers, *spina nigra*, the black-thorn; and the durable nature of our common sloe-tree, or black-thorn, growing on our hedges, has tempted some to believe it to be the same with the *setan*, or *spina nigra* of the ancients; but this is overthrown by the common account of Pliny, and others, of ships being built of this wood, the small size of our black-thorn rendering it wholly impossible to put it to such uses.

Theodotion is to be understood of this wood, when he speaks of the *setab*, or *acanthina*.

It is plain, from Avicenna, that this *setan*, or *seitan*, is no other than that species of *acacia*, which, from its producing our gum arabic, is called the *gum arabic tree*.

SEITIL, in *Commerce*, a wine measure at Vienna; 168 seitils = 70 kopfen = 40 maafes = 4 viertels = an eimer; and 30 eimers = a dreyling, and 32 eimers = a fuder of wine. The contents of a maafs are 71 $\frac{1}{2}$ French cubic inches, or 86 $\frac{1}{10}$ English ditto, or 3 English pints nearly; so that one eimer is = 15 English gallons.

SEITSAARI, in *Geography*, an island of the Baltic, five versts long, and about half as much in breadth, distant 95 versts from St. Petersburg, and 75 from Vyborg. The sand-banks here reach as far as to the Peterburg channel, and, being invisible from their lying under water, are so dangerous in dark nights, that in this place alone not fewer vessels have been lost than in all other parts of the gulf of Finland together. The land is every where unfruitful; though in some of the marshes there is a slight crop of hay. Great numbers of eels and stone perch are caught here. The herring and seal fisheries are also considerable. The inhabitants compose about 20 families. Here is a light-house.

SEITTENHOFF, a town of the duchy of Carniola; 3 miles N. of Weixelburg.

SEITZ, a town of the duchy of Stiria; 6 miles N.E. of Cilley.

SEJUR, a river of Syria, that rises a little N. of Antab, and after a course of about 30 miles through a plain deriving its name from it, loses itself in the earth.—Also, a town of Syria; 15 miles S. of Antab.

SEIX, a town of France, in the department of the Arriege; 7 miles S. of St. Giron.

SEIZE, SEAZE, or *Seise*, *To*, in *Sea Language*, is to join two ropes, or the two ends of one rope, together, &c. by several close turns of small rope, line, or spun-yarn, round them, with two or more cross-turns.

Throat-feizing, is the first feizing clapt on where a rope or ropes cross each other; see RIGGING, Plate N° 11. fig. 16, at 5.

Middle-feizing, is a feizing between a throat and end-feizing, as at 6.

End-feizing, is a round feizing near the end of a rope, as at 7, on the same plate.

Eye-feizing, is a round feizing next the eye of a shroud, &c. RIGGING, Plate II. fig. 15, at 3.

The *feizing*, *seasing*, or *seasen of a boat*, is a rope tied to a ring or little chain in the foreship of the boat, by which means it is fastened to the side of the ship.

SEIZING, in *Falconry*, is when an hawk gripes her prey, or any thing else, fast between her claws.

SEIZURE, in *Commerce*, an arrest of some merchandize, moveable, or other matter, either in consequence of some law, or of some express order of the sovereign.

Contraband goods, those fraudulently entered, or landed without entering at all, or landed at wrong places, are subject to seizure.

In seizures among us, one half goes to the seizer, or informer, and the other half to the king. In France, half the painted linens, &c. seized, used to be burnt, and the other half sent abroad; but in 1715, by an arret of council, the whole was ordered to be burnt.

SEKI, in *Geography*, a town of Japan, in the island of Nippon; 20 miles S.S.W. of Ixo.

SEKIALE, a town of Arabia, in the province of Nedsjed; 300 miles E. of Madian.

SEKIDO, a town of Africa, on the Gold Coast, in the district of Agouna, which has an English factory.

SEKIN,

SEKIN, a town of Asiatic Turkey, in Caramania, 30 miles S.W. of Selekkeh.

SEKMARA, a town of Africa, in the kingdom of Wangara, on the Niger; 340 miles E. of Ghana. N. lat. $45^{\circ} 30'$. E. long. 18° .

SEKOOBOOM, a small island in the Soolóo Archipelago. N. lat. $5^{\circ} 5'$. E. long. $120^{\circ} 20'$.

SEL, LE, a town of France, in the department of the Ille and Vilaine, and chief place of a canton, in the district of Redon; 7 miles N.N.E. of Bain. The place contains 3447, and the canton 4971 inhabitants, on a territory of $132\frac{1}{2}$ kilometres, in 7 communes.

SEL, in the *Materia Medica of the Ancients*, a name given to the fruit of an Indian plant, resembling the cucumber in its manner of growth, but bearing a fruit like a pistachia-nut.

There are three of these fruits mentioned by the Arabian writers, the *bel*, *fel*, and *sel*.

They tell us expressly that the *bel* and *fel*, as also the fruit *fel*, were not the fruit of a tree, but of a plant, and that of the creeping kind. It is very probable, that the other *fel* of Avicenna is the root of the *nymphaea Indica*, which he mentions in the chapter of *nenuphar*, as possessing the same virtues which he attributes to this sort of *fel*, or the same with those of mandrake.

SELA, in *Ancient Geography*, a town of Palestine, in the tribe of Benjamin, according to Joshua. Here Saul was interred in the tomb of his father Cis.—Also, a river of Peloponnesus, the mouth of which is placed by Ptolemy on the coast of Messenia, between the promontory Cyparisus and the town of Pybus.

SELABINA, in *Geography*, a town of Hungary, 4 miles S.W. of Rosenburg.

SELACHLEA, a town of Abyssinia; 20 miles E. of Siré.

SELAGEREH, a town of Assam, on the Burram-pooter; 60 miles N.W. of Ghergong.

SELAGINOIDES, in *Botany*, the name of a genus of mosses in the arrangement of Dillenius, a species of *lycopodium*; the characters of which are these: the capsules are produced in the axæ of the leaves, in the manner of those in the *selago*, but they are of a different form, being tricoccus, and sometimes quadricoccus, and opening, when mature, into four valves.

Of this genus of mosses we have only one known species, which is the prickly *selaginoides*, commonly called *feeding mountain moss*. This is found in the mountainous parts of Yorkshire, and in Wales, and loves rocky and moist places.

SELAGO, an ancient generic name in the works of Pliny, who observes that the plant so called was in great repute among the Celtic nations; its juice being expressed and used by the Druids as a remedy for many disorders, especially for diseases in the eyes. The name indeed (says De Theis) is expressive of this latter quality, being derived from the Celtic words *sel*, fight, and *jack*, good or salutary. The celebrated hall of Fingal, recorded in Ossian's poems, owes its appellation to the same source, *Selma* meaning beautiful to behold, *belle-vue*. *Selago* has also been thought to be derived from *selego*, to choose; the Druids having gathered or selected it both for medicinal and religious purposes. It is impossible to make out the reasons which induced Linnæus to apply this name to the genus under consideration; which appears to have nothing in common with the celebrated succulent *Selago* of the ancients.—Linn. Gen. 317. Schreb. 399. Willd. Sp. Pl. v. 3. 181. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 3. 431. Juss. 110 Lamarck Illustr.

t. 521. Gærtn. t. 51.—Class and order, *Didymia Gymnospermia*. Nat. Ord. *Aggregate*, Linn. *Vitices*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, small, permanent, cloven into four, occasionally five, segments, the lower one larger. *Cor.* of one petal: tube very small, thread-shaped, scarcely perforated: limb spreading, five-cleft; the two upper segments smaller, the bottom one larger. *Stam.* Filaments four, capillary, the length of the corolla, to which they are attached, the two upper ones longer; anthers simple. *Pist.* Germen superior, roundish; style simple, as long as the stamens; stigma simple, acute. *Peric.* none, except the corolla involving the seed. Seeds one or two, roundish.

Efl. Ch. Calyx four-cleft. Corolla a capillary tube, with an almost equal limb. Seeds one or two.

Jussieu observes that all the species of *Selago* are herbaceous or shrubby; and that the flowers in most of them are allied to those of *Eranthemum* and *Verbena*.—Willdenow enumerates twenty species, and so does professor Martyn. From the joint stock of these two authors, the following ones are selected, as an epitome of the genus. They are all natives of the Cape of Good Hope, flowering for the most part between June and September.

S. corymbosa. Fine-leaved Selago. Linn. Sp. Pl. 876. (*Camphorata africana umbellata frutescens*; Commel. Hort. v. 2. 79. t. 40.)—Corymb much divided. Flowers separate. Leaves thread-shaped, in bundles.—Stems slender, woody, seven or eight feet high, branched, not strong enough to support themselves. Leaves short, linear, hairy, in axillary clusters. Flowers small, perfectly white.

S. polystachya. Many-spiked Selago. Linn. Mant. 250. (*Valerianella africana fruticans, foliis ericæ*; Commel. Hort. v. 2. 221. t. 111?)—Corymb composed of numerous clustered spikes. Leaves thread-shaped, in bundles.—Stem erect, six inches high, branched at the top. Leaves somewhat rigid; linear, short. Flowers numerous, white.

S. Rapunculoides. Rampion-leaved Selago. Linn. Sp. Pl. 877. Amer. Acad. v. 4. 319. (*Rapunculus, foliis angustissimis, dentatis, floribus umbellatis*; Burm. Afr. 113. t. 42. f. 1.)—Spikes forming a corymb. Leaves toothed.—Root long, woody, creeping, fibrous. Stems erect, simple, two feet high, thick, rough. Leaves sessile, very narrow and rough, toothed and pointed. Flowers terminal, corymbose, nearly umbellate.

S. spuria. Linear-leaved Selago. Linn. Sp. Pl. 877. (*Melampyrum africanum, spicatum, foliis angustissimis dentatis*; Burm. Afr. 115. t. 42. f. 3.)—Spikes corymbose. Leaves linear, with small teeth.—Stem about two feet in height, branched, round, purplish. Leaves alternate, clustered, resembling those of *Hebenstreitia dentata*. Flowers in ovate, oblong spikes, closely imbricated, violet-coloured.

S. fasciculata. Cluster-flowered Selago. Linn. Mant. 250. Jacq. Ic. Rar. v. 3. t. 496. Collect. v. 3. 246.—Corymb much divided. Leaves obovate, smooth, serrated. Stem quite simple, erect, about two feet high. Leaves alternate, oblong, serrated except towards the base, slightly decurrent, dark green above, yellowish underneath. Flowers purple or violet-coloured, forming an elegant, terminal, capitate corymb.

S. ovata. Oval-headed Selago. Willd. n. 11. Curt. Mag. t. 186. (*Lippia ovata*; Linn. Mant. 89.)—Spikes conical, cylindrical, terminal. Leaves scattered, linear. Stem shrubby.—A prostrate shrub, about a foot high. Stems slender, hairy, branched. Leaves slightly succulent; several smaller ones at each axil, generally ternate. Flowers white, with a yellow spot on the two uppermost segments, and

and sometimes on all of them, and an orange spot at the mouth of the tube. *Bractææ* alternate, ovate, large. It is valuable not so much on account of its beauty as its fragrance. Linnæus described it under the name of *Lippia ovata* from a dried specimen, which may account for his saying the flowers are of a dark-violet colour. M. L'Héritier first referred it to *Selago*; in doing which, Mr. Curtis observes, it would have been better to change the specific name to *bractæata*, its floral leaves or bractææ constituting the most prominent feature of the plant.

SELAGO, in *Gardening*, furnishes plants of the shrubby and under-shrubby kinds, of which the species cultivated are; the fine-leaved selago (*S. corymbosa*); the linear-leaved selago (*S. spuria*); and the ovate-headed selago (*S. ovata*).

Method of Culture.—These plants may be increased by cuttings and layers. The cuttings should be made from the young under-shoots, and be planted out during the summer months in a bed of fresh earth, covering them close with a bell or hand-glass, shading them from the sun, and refreshing them now and then with water. They should be gradually hardened, and then transplanted into small pots, placing them in the shade till they have taken root. The layers may be laid down in the autumn or spring, and when well rooted be taken off and planted out in pots, as above. The plants should afterwards be placed out with other hardy greenhouse plants, and about the end of October removed into the dry stove. They only require protection from frost, being treated in the same manner with the hardier sort of greenhouse plants.

They afford much ornament and variety in greenhouse collections, among other similar plants.

SELAH, in *Scripture Criticism*, a word which occurs no less than seventy times in the Hebrew text in the Psalms, and which has occasioned great difficulty to the critics. The Septuagint renders it *διεψαλμα*, *q. d.* a pause in singing: and this, it must be owned, was greatly wanted before the Psalms were divided into verses.

SELAM, in *Geography*, a town of Egypt, on the left bank of the Nile; 6 miles N. of Siut.—Also, a town of Mexico, in the province of Yucatan, near the coast; 45 miles N.W. of Merida.

SELAME', an island, or rather cluster of small islands, near the coast of Arabia, at the entrance into the gulf of Persia, near cape Moçandum.

SELAMUM, a town of Egypt, on the W. branch of the Nile; 48 miles N.N.W. of Cairo.

SELANIEH, or ZELANIEH, a town of Egypt, on the E. branch of the Nile, opposite to Damietta.

SELANION, in *Botany*, a name by which some authors have called the common *crocus vernus*, or the garden spring-flower, which we call the *crocus*.

SELB, in *Geography*, a town of Germany, in the principality of Culmbach; 14 miles S.E. of Hof.

SELBE, a river of the Isle of Man, which runs into Ramsey harbour.

SELBERG, a mountain of Austrian Swabia; 4 miles W.N.W. of Schonau.

SELBISTAN, a small town of Persia, in the province of Farfistan, at the distance of 18 furlongs from the capital of the province, containing about 4000 inhabitants, situated at the foot of a hill, on the banks of a small stream, which is mostly absorbed in the irrigation of the gardens and fields adjoining the town.

SELBITZ, a town of Germany, in the principality of Culmbach; 3 miles S.S.E. of Lichtenberg.—Also, a river of Germany, which rises in the principality of

Culmbach, and runs into the Saal, 2 miles N.E. of Lichtenberg.

SELBOE, a town of Norway, in the diocese of Drontheim, where a copper-mine was discovered in the year 1712; 40 miles S.E. of Drontheim.

SELBOSOE, a town of Norway, in the province of Drontheim; 16 miles S.S.E. of Drontheim.

SELBY, a market-town partly within the liberty of St. Peter of York, and partly in the lower division of the wapentake of Barkston Ash, West Riding and county of York, England, is situated on the fourth bank of the river Ouse, at the distance of 14 miles S. by E. from York, and 181 miles N. by W. from London. This town is of great antiquity, having been known in Saxon times by the appellation of Salebia. In the year 1070, William the Conqueror erected a monastery at Selby; and having shortly after visited his new foundation, along with his queen, the latter was here delivered of a son, who succeeded to the throne by the title of Henry I. From these circumstances this place derived considerable celebrity; and was endowed with various privileges. Many of these, however, are now lost, but it still retains a market, held on Monday weekly, and three annual fairs, held on Easter Tuesday, the 22d of June, and the 10th of October. Here also are holden the petty sessions for the wapentake of Barkston Ash.

Selby abbey stood on the west side of the town. It was dedicated to the honour of St. Mary and St. German; and was filled with monks of the Benedictine order. King William Rufus gave the patronage of it to the archbishop of York and his successors, in lieu of the claim they had to some part of Lincolnshire. Previous to the dissolution its revenues were valued at 729*l.* 12*s.* 10*d.* *per annum*, according to Dugdale; and at 819*l.* 2*s.* 6*d.* according to Speed; which, with the abbey itself, were granted by king Henry VIII. to sir Ralph Sadler. Since that period the buildings of this monastery have been appropriated to various uses; and most of them are now demolished, except the church, which appears to have been a very spacious and elegant pile. From the various styles of its architecture, no doubt can be entertained of its having been erected at different periods. The oldest divisions are the body and nave, which evince an early Norman origin, and are probably coeval with the foundation of the abbey. The western front, though extremely irregular, is exceedingly curious, both with respect to structure and ornaments. The entrance on this side, and likewise the northern porch, are particularly worthy of observation. The form of this church is that of a cross, the shaft of which measures 267 feet in length, and its transept 100 feet. From the centre of the whole pile rises a massive tower, which was rebuilt in 1702. On each side of the choir are twelve ancient stalls, similar in form and workmanship to the prebendal stalls in York cathedral. In the windows are considerable remains of stained glass, representing the armorial bearings of Thomas, earl of Lancaster, and other distinguished characters of the fourteenth and fifteenth centuries. Here are likewise several ancient monuments, and a great variety of modern date, *i. e.* erected since the church became the parochial place of worship about the year 1600.

According to the parliamentary returns of 1811, Selby parish contains 742 houses, and 3363 inhabitants. The principal trade of the town consists in ship-building, and in the manufacture of leather, sail-cloth, and iron articles.

Five miles to the northward of Selby is the village of Cawood, remarkable for the ruins of its ancient castle, which is said to have been erected by king Athelstane in the year 920, and which afterwards became a palace of the archbishops

archbishops of York. The stately entrance or gateway is still remaining, on the summit of which cardinal Wolsey used to sit, and enjoy the view of the surrounding country. Ca-wood castle continued in all its splendour till the commencement of the civil war in 1641, when it was seized upon, and garrisoned for the parliament. It subsequently, however, fell into the hands of the king's party, and sustained a siege of ten months before it was retaken by the parliamentary troops, when it was ordered to be demolished. *The History of Selby*, by James Mountain, 12mo. York, 1800. *Beauties of England and Wales*, vol. xvi. by John Bigland, 8vo. 1812.

SELCH SKERRIE, one of the smaller Orkney islands, a little N. of North Ronaldsha.

SELCHA, or SELECHA, in *Ancient Geography*, a town of Judæa, situated in the half tribe of Manasseh, on the other side of Jordan, according to Joshua.

SELDEN, JOHN, in *Biography*, a very distinguished scholar, and an eminent political character, called by Grotius "the glory of England," was born at Salvington, in Sussex, in 1584. He was educated at the free-school at Chichester, whence he was sent to Hart-hall, Oxford, where he resided about four years. He then removed to London, for the study of the law, and with this view entered himself in Clifford's-Inn, and about two years after he removed to the Inner Temple, where he soon acquired great reputation by his learning. He had already made himself known by some works of great merit, and this year he wrote verses in Latin, Greek, and English, upon Mr. William Browne's *Britannia's Pastorals*.

Having been called to the bar, he occasionally pleaded, but was much more employed as a chamber counsellor. The first object of his private studies was the history and antiquities of his own country, and in 1607 he drew up a work, entitled "Analecton Anglo-Britannicon," which was a chronological summary of English history down to the Norman conquest. This work was followed, in 1610, by "England's Epinomis," and "Jani Anglorum Facies altera," a Latin and English treatise on the origin and progress of English law. By these compositions he became known as a diligent enquirer into the early history and constitution of his country, and acquired the esteem of several eminent literary characters, among whom were Camden, Spelman, and sir Robert Cotton. He was also on familiar terms with Ben Jonson, Drayton, Browne, and other poets of that period, who seem to have regarded his learning and talents with great respect, though his genius appears to have been inclined to poetry. In 1614 he published his largest English work, a treatise on "Titles of Honour," in which he displayed a vast extent of reading, directed by sound judgment. It became a standard authority with regard to all that concerns the degrees of nobility and gentry in this kingdom, in which light it is still referred to; and it abounds in historical information concerning the origin of such distinctions as he traced through other countries. In the year 1617 he entered upon a wider field of literature, and made himself known to the learned throughout Europe, by a celebrated work "De Diis Syris." The chief or leading object of this performance was to treat on the heathen deities mentioned in the Old Testament, but he extended it to an enquiry into Syrian idolatry in general, with occasional illustrations of the theology of other nations. This work was received with great applause by the learned world, and a new and improved edition of it was printed at Leyden, under the care of Daniel Heinsius.

Hitherto Selden had passed his life in the tranquillity of a man of letters, engaged in subjects not liable to debate; but

his next publication, being "A History of Tythes," printed in 1618, subjected him to much angry opposition, and brought upon him, says his biographer, "a storm from a quarter which has always proved dangerous to free enquirers." In the work alluded to, he had considered the question of the divine right to that impost, advanced by the clergy, and now beginning to be maintained by the English church, and though he only treated of it as a matter of his history, without arguing for or against the right, yet as the sum of his authorities manifestly inclined the balance to the negative side of the question, some of the clergy took offence at his freedom, and made an accusation against him before king James. That sovereign, who was fond of interfering in theological disputes, and who was always desirous of keeping on good terms with the church, sent for Mr. Selden, and gave him a lecture on the subject, and being afterwards called before the archbishop of Canterbury, and some other members of the high commission court, he was induced so to degrade himself, as to sign a declaration of his sorrow for what he had done. He, however, cautiously avoided retracting his opinion, or contradicting the facts which he had produced. Several answers to Selden's work were published, to which he was not permitted publicly to reply, though he circulated some remarks upon them among his friends. This incident unquestionably confirmed him in that hostility to civil and ecclesiastical tyranny which ever after marked his conduct. Selden was next to shine in the character of an advocate for constitutional liberty, with which his name is now so closely allied. The parliament which James's necessities had obliged him to convoke in 1621, was soon at issue with him on the point of their powers and privileges, all of which the king asserted to have been grants from his predecessors and himself, while they maintained them to be an inheritance from their ancestors. Selden being referred to by the parliament as the ablest legal antiquarian of his time, for information relative to the ancient privileges of that body, spoke so freely before them against the practices of the court, and was so instrumental in drawing up their spirited protestations, that he was selected as one of the victims to the royal resentment, and committed to custody. His imprisonment was not rigorous, and he was soon discharged upon his own petition. Resuming now his antiquarian studies, he edited, in 1723, the historical work of Eadmer, a monk of Canterbury, with learned notes relative to the laws and customs established by William the Conqueror. In the following year he was elected to the new parliament, as one of the representatives for Lancaster, but nothing occurred to call forth his exertions during that session. He was again a member in the two first parliaments of king Charles, in the second of which he was appointed to support some articles of impeachment of the duke of Buckingham. He afterwards took up the cause of sir Edward Hampden, who had been imprisoned for refusing to contribute to a forced loan; and in 1628 he was the person whom the house of commons employed to produce matter of record to justify its resolutions in favour of the subject's right to his liberty and property. These useful and very honourable labours did not so entirely engross his attention, but that he found time, in 1629, to draw up his learned treatise, entitled "Marmora Arundeliana," the occasion of which was the importation by the earl of Arundel of some very ancient Greek marbles, containing inscriptions of great value in the study of history and chronology. This was another obligation conferred by Selden on the learned world, which was received with due gratitude.

On the dissolution of the parliament, on account of its vigorous proceedings against the measures of the court, Selden

den was one of the eight members of the house of commons who were thrown into the prison of the Tower, on a charge of sedition. Their application to be released on bail was only assented to by the judges, on condition of giving security for future good behaviour, which they refused to do, as repugnant to the dignity of parliament, and the rights of Englishmen. Being brought up by virtue of the habeas corpus act to Westminster-hall, the like condition was again proposed, and again rejected, and both parties seemed to persist in their determination: of course the term of imprisonment was indefinitely protracted. Its rigour was, however, softened, and shortly after became very lenient. Selden being removed, first to the Marshalsea prison, and then to the Gatehouse, was at length suffered to go at large on bail, as were the others likewise, till the beginning of 1634, when bail was no longer required, and they were fully liberated. Their firmness was much applauded by the parliament party, and Selden was distinguished among them as being their spokesman, when the point was argued before the judges. During the imprisonment of Selden, his mind was not inactive; his studies were turned to Jewish history and antiquities, and the first fruits of them were shewn in a work entitled "*De successione in bona defuncti ad leges Ebraeorum*," which was published in 1631, and reprinted in 1636, with the addition of a treatise "*De successione in Pontificatum Ebraeorum*." Selden had long employed his great talents in a work which was intended to assert and justify the maritime prerogatives of this country, in opposition to the principles advanced by Grotius in his work entitled "*Mare Liberum*." Selden's treatise was, after it had long lain on the shelf in MS., read and approved by king James: and the subject, in 1635, having become very interesting in consequence of some disputes with the Dutch, his majesty commanded its publication. It was therefore fitted by him for the press, and appeared in that year under the title of "*Mare Clausum seu Dominio Maris*." In this performance, the author first attempts to prove, by reasoning and example, that the sea is capable of dominion: and then to establish historically the British right over the circumjacent, or, as they have been denominated by others, the narrow seas. (See Campbell's *Lives of the Admirals*, vols. i. ii.) This author, speaking of Mr. Selden and his *Mare Clausum*, says in which, "he has effectually demonstrated, from the principles of the law of nature and nations, that a dominion over the sea may be acquired, and from the most authentic histories, that such a dominion has been claimed and enjoyed by several nations, and submitted to by others for their common benefit: that this was, in fact, the case of the inhabitants of this island, who, at all times, and under every kind of government, had claimed, exercised, and constantly enjoyed such a dominion, which had been confessed by their neighbours frequently, and in the most solemn manner. All which, with learning, industry, and judgment superior to praise, this great man hath fully and unquestionably made out to the satisfaction of foreigners, as it is the design of this work to impress the same sentiment on the minds of all sensible Britons, viz. "that they have an hereditary, uninterrupted right to the sovereignty of their seas, conveyed to them from their earliest ancestors, in trust for their latest posterity."

Selden's work was, in truth, acceptable to all parties, and the king in council ordered copies of it to be kept in the council chest, the court of exchequer, and the court of admiralty, as faithful and strong evidence to the dominion of the British seas. Several following years of Selden's life seem to have been chiefly occupied in Hebrew studies, of which one of the principal products appeared in 1640, under

the title "*De Jure Naturali et Gentium juxta disciplinam Ebraeorum*:" Lib. septem. This work is a copious digest of Jewish laws and institutions, as well from the rabbinical writers, as from the writings of the Old Testament, which is generally esteemed a valuable repertory of all the matter afforded by history or tradition relative to the subject.

This year, 1640, the long parliament met, and Selden was chosen one of the representatives for the university of Oxford. His name appears in several committees appointed for the correcting of the abuses, and restraining the oppressions of the reign, which parliament was, at this period, resolved to pursue. One of its strong measures, viz. the impeachment of lord Strafford, he did not concur in, not considering that this measure was warranted by the law of the land. Nor did he seem willing to proceed further in the reformation of religion, than to check the usurpations of ecclesiastical power, to which he was a most decided enemy; and he had no wish whatever to abrogate the episcopal form of church government, which he preferred to the presbyterian. So well affected was he, upon the whole, to the existing constitution in church and state, that after the king had withdrawn to York, there was a design of appointing him keeper of the great seal. When the differences between the king and parliament were manifestly tending to an open rupture, Selden opposed the attempts of both parties to gain possession of the power of the sword, hoping that the strong arm of the law might prove sufficient to settle the contest, and when his efforts had proved fruitless, he withdrew, as much as he was able, from public business. He remained, however, in parliament, and was one of the synod which met at Westminster for the establishment of church government. In 1643 he was appointed by the house of commons keeper of the records in the Tower, and in the next year he subscribed the Solemn League and Covenant. It is mentioned to his honour, that he constantly employed his influence, in these contentious times, for the service and protection of learning and learned men; and the university of Oxford, on different occasions, expressed its gratitude for the good offices which he performed for it in times of its distress. He likewise befriended the sister university, in which he was regarded with so much veneration, that he was elected to the mastership of Trinity-hall, though he thought it right to decline the office. His learned labours were still unintermitted, and new works were occasionally issuing from his pen. Of these, the most considerable were, "*Eutychii Ægyptii Origines Ecclesiæ suæ*," translated from the Arabic; "*De Anno Civili Veteris Ecclesiæ*;" "*Uxor Ebraica*," which contained an account of all the Jewish rites and institutions relative to marriage; an edition of the ancient work entitled "*Fleta*;" "*De Syneodis Veterum Ebraeorum*," being a copious account of the juridical courts of the Jews. His concluding work was "*Vindiciæ de Scriptione Maris Clausi*," the object of which was to controvert a malignant insinuation of a Dutch author, that he had composed his *Mare Clausum* in order to please king Charles, and obtain his liberation from imprisonment. Selden died in November 1654, having completed his seventieth year. He was interred with great solemnity in the Temple church, and on this occasion the learned Usher pronounced a funeral discourse. Selden was always in affluent circumstances, and had intended, at his death, to bequeath his valuable library and museum to the university of Oxford, but owing to some offence given to him, he left it to his executors, who, however, restored them to their first destination, and they now make part of the Bodleian library. After his death, his amanuensis printed a collection of Selden's sayings, entitled "*Table Talk*,"

Talk," which contains much curious matter, and became popular.

"Selden," says Dr. Aikin, to whose lives of Selden and Usher our readers are referred for much curious and interesting matter, "was one of the most learned men of his time, and though the nature of his subjects, and a harsh and difficult style, have thrown his works out of the ordinary course of reading, yet he has been a considerable benefactor to literature, and his merit, as such, has been freely acknowledged by the most eminent scholars at home and abroad. Grotius, Salmassius, Bochart, Gerard Vossius, Gronovius, Daniel Heinsius, and many other writers of great celebrity, have mentioned him with high encomium, and in England he was looked up to as at the head of a literary body. He was liberal in his patronage of men of letters, and appears to have been free from the jealousy and arrogance too frequently accompanying the learned character. Lord Clarendon, though widely different from him in political sentiments, has, in his own life, spoken of him in terms of profound respect and admiration; and from personal knowledge, has testified to the amiable qualities of his heart, and urbanity of his manners, as well as to the powers of his understanding." Another author observes that he was a man of uncommon gravity and greatness of soul, averse from flattery, liberal to scholars, and charitable to the poor. His works were published collectively in three vols. folio, by Dr. David Wilkins, in 1726, with a Latin life of the author.

Selden is celebrated in German musical dictionaries, as a musical writer, for his notes on the Arundelian Marbles, concerning Hyagnis, the inventor of the flute, the Ambabaïæ, Terpander, and the Nomes of the ancients.

SELE, in *Ancient Geography*, a town of Asia, in the interior of Susiana. Ptolemy.

SELE, in *Geography*, a river of Naples, which runs into the gulf of Salerno. N. lat. $40^{\circ} 28'$. E. long. 13° .—Also, a town of Nubia; 85 miles W. of Arkiko.

SELEBAR, a river on the W. coast of Sumatra, which runs into the sea, S. lat. $4^{\circ} 2'$. E. long. $102^{\circ} 15'$.

SELECTI JUDICES, in the *Roman Republic*, were persons appointed by the prætor with the mutual consent of contending parties, and bearing in many respects a remarkable resemblance to our juries; for they were first returned by the prætor, then their names were drawn by lot, till a certain number was completed; then the parties were allowed their challenges; next they struck what we call a tales; and, lastly, the judges, like our jury, were sworn.

SELEFKE', or ITSCHIL, in *Geography*, a town of Asiatic Turkey, in the province of Caramania, seated on a river which soon after passing the town discharges itself into the Mediterranean, opposite to the island of Cyprus; anciently called *Seleucia*. It is now the residence of a san-giac, under the government of Cyprus. N. lat. $36^{\circ} 40'$. E. long. $33^{\circ} 30'$.

SELEMEUS, in *Ancient Geography*, a river of Achaia, N.W. and E. of the river Charadrus, which discharged itself into the gulf of Corinth.

SELEMIE, in *Geography*, a town of Egypt, on the E. branch of the Nile; 43 miles N. of Cairo.

SELENÆ, Σεληναι, in *Antiquity*, a kind of cakes used in sacrifices, and so called from their being broad and horned, in imitation of the new moon.

SELENDERS, in the *Manege*, are chaps or mangy sores in the bending of a horse's hough, as the *malanders* are in the knees.

SELENEUSIACA TERRA, *Earth of Seleneusia*, in the *Materia Medica of the Ancients*, a light fungous earth, called by later naturalists *agaricus mineralis*, and when

found in form of powder, or in a discontinuous state, *lac lunæ*.

It is an earth common enough, wherever there are stone quarries, all over the world; but the finest ever met with is that from Sicily, the place where the ancient Seleneusia, or Selinus stood, and from whence the ancient physicians had it. Some of them have called it the *creta Seleneusiaca*; but all their descriptions agree in proving it to be this very earth now found there. Dioscorides and Galen mention its remarkable diffusibility in water, and Pliny mentions its melting in a kind of juice, or smooth homogeneous substance with it; properties so very applicable to this earth, and so little so to any other, as to leave no doubt of their having been originally applied to the very same substance.

The ancients gave it internally as an astringent; but its principal use was external, as a cosmetic among the ladies. And Dr. Plot recommends our lac lunæ, on personal experience, for the same purposes.

SELENGA, in *Geography*, a river which rises in Chinese Tartary, and traversing the confines of Russia, runs into the Baikal lake, 36 miles W.N.W. of Verchnei Udinsk.

SELENGINSK, a town of Russia, in the government of Irkutsk, at the conflux of the Selenga and Chilok. It was made an ostrog in the year 1666, and about 20 years afterwards, the fort, which is now standing, was built, and to this the place owes its prosperity. The town lies parallel to the river, and contains two churches, and about 150 houses, inclosed within the fortification. This is defended by five pieces of brass cannon, and as many iron guns; and the garrison consists of a regiment of soldiers. The inhabitants are nicknamed "Peroshniki," from the great quantities of sand found in these parts. The whole adjacent country is mountainous and barren, but a few miles below it there is good arable land. The country about Selenginsk yields a great quantity of rhubarb, inasmuch that the rhubarb exported from Russia grows in these parts; 84 miles S.E. of Irkutsk. N. lat. 51° . E. long. $106^{\circ} 44'$.

SELENIACON, a name for a kind of amulet worn for the epilepsy.

SELENITE, in *Mineralogy*, crystallized gypsum. See GYPSUM, and *Sulphate of LIME*.

SELENIZ, in *Geography*, a mountain of Carinthia; 10 miles S. of Clagenfurt.

SELENOGRAPHY, formed from σελήνη, *moon*, and γεωγραφία, *description*, a branch of cosmography, which describes the moon, and all the parts and appearances of it, as geography does those of the earth.

Since the invention of the telescope, selenography is very much improved.

We have now distinct names for most of the regions, mountains, &c. visible in the moon's body. The first who attempted, but in a very rude manner, to make a map of the moon's surface, was Riccioli. Hevelius, a celebrated astronomer, who was a burgher-master of Dantzic, and who published his selenography, represented the appearance of the moon in its different states from the new to the full, and from the full to the new, and named the several places of the moon from those of the earth, which figures Mayer prefers; but Langrenus and Ricciolus named them afterwards, from the names of the celebrated astronomers and philosophers, assigning the largest spots to those of the most celebrated characters, which distinction is now generally followed. Thus, what the one calls *mons Porphyrites*, the other calls *Aristarchus*. What the one calls *Ætna*, *Sinai*, *Athos*, *Apenninus*, &c. the other calls *Copernicus*, *Possidonius*, *Tycho*, *Gassendus*, &c. A map of the moon, as it appears when full, was drawn by Cassini, who published a work entitled

entitled "Instructions Seleniques." The late Mr. Ruffel, a painter of eminence, made excellent drawings of the moon; but the most accurate and complete that have yet been published, are those of the celebrated Schroeter, who has given highly magnified views of most parts of the moon's surface. Dr. Brewster, in his improved edition of Ferguson's Astronomy, has given several tables of the lunar spots. The first of these tables is formed from the observations of Lambert, and contains the longitude and latitude of 207 spots, with the names given them by Riccioli and Hevelius, together with remarks on their position, appearance, and structure. The second table contains the longitude and latitude of 89 lunar spots, as determined by Tobias Mayer, with general remarks. The third table exhibits the new names which have been given to the anonymous lunar spots by Jer. Schroeter, with their positions, as determined by the editor, from a comparison of Schroeter's plates with Mayer's engraving of the moon, and his table of the lunar spots. Our limits will not allow of our insertion of either of these tables, and they are incapable of abridgment.

SELENTI, in *Geography*, a town of Asiatic Turkey, in Caramania, at the mouth of the river Selenti, which here runs into the Mediterranean; 45 miles E. of Alanieh. N. lat. $39^{\circ} 3'$. E. long. $29^{\circ} 18'$.

SELERNES, one of the smaller Shetland islands. N. lat. $60^{\circ} 40'$. W. long. $1^{\circ} 22'$.

SELESTRIA, a town of Asiatic Turkey, in Caramania; 50 miles S.W. of Tarsus.

SELETZKAIA, a town of Russia, in the government of Archangel; 80 miles S. of Archangel.

SELEUCIA, in *Ancient Geography*, a famous city of Asia, built by Seleucus, one of Alexander's generals, and situated on the western bank of the Tigris, about 45 miles N. of ancient Babylon, was the capital of the Macedonian conquests in Upper Asia, and is said to have been the first and principal cause of the destruction of Babylon. Pliny reports, that the intention of the first of the Seleucidæ was to raise, in opposition to Babylon, a Greek city, with the privilege of being free. The ramparts and fosse of this Grecian city are said to be nearly opposite to the ruins of Ctesiphon (which see); and in process of time Seleucia and Ctesiphon became united and identified, under the name of Al Modain (which see), or the two cities. For the precise situation of Babylon, Seleucia, Ctesiphon, Modain, and Bagdad, cities often confounded with each other, we refer with Gibbon, to an excellent geographical tract of M. d'Anville, in *Mem. de l'Academie*, tom. xxx. Many ages after the fall of the Macedonian empire, Seleucia retained the genuine characters of a Grecian colony, arts, military virtue, and the love of freedom. The independent republic was governed by a senate of 300 nobles; the population consisted of 600,000 citizens; the walls were strong; and as long as concord prevailed among the several orders of the state, they viewed with contempt the power of the Parthians; but the madness of faction was sometimes provoked to implore the dangerous aid of the common enemy, who was posted almost at the gates of the colony. The Parthian monarchs, like the Mogul sovereigns of Hindoostan, delighted in the pastoral life of their Scythian ancestors; and the imperial camp was frequently pitched in the plain of Ctesiphon, on the eastern bank of the Tigris, at the distance of only three miles from Seleucia. (See Strabo, lib. xvi. p. 743.) By the influx of the innumerable attendants on luxury and despotism, who resorted to the court, the little village of Ctesiphon insensibly swelled into a great city. Under the reign of Marcus, A.D. 165,

the Roman generals penetrated as far as Ctesiphon and Seleucia. They were received as friends by the Greek colony; they attacked as enemies the seat of the Parthian kings; and yet both experienced the same treatment. The sack and conflagration of Seleucia, with the massacre of 300,000 of the inhabitants, tarnished the glory of the Roman triumph; though it has been alleged in their favour, that the citizens of Seleucia had first violated their faith. Seleucia, already exhausted by the neighbourhood of a too powerful rival, sunk under the fatal blow: but Ctesiphon, in about 33 years, had sufficiently recovered its strength to maintain an obstinate siege against the emperor Severus.

Browne (*Travels in Africa*, p. 391.) identifies Seleucia with Suadea, the port of Antioch, about four hours distant from it. Its former possessors, he says, took immense pains to render it convenient for traffic; but it is now rendered useless, by the negligence of its present masters. A large gate, says this traveller, yet remains entire; it approaches to the Doric order. The rock near it has been excavated into various apartments. A part exists of the thick and substantial wall which defended Seleucia towards the sea. The port must have been commodious and secure, though small, as it was formed by a mole of very large stones. Although it be at present dry, the sand in the bottom appears no higher than the surface of the sea. A little to the north is a remarkable passage, cut in the rock, leading, by a gentle descent, from the summit of the mountain towards the water. It is about 600 common paces long, from 30 to 50 feet high, and above 20 broad. In the middle of it is a covered way, arched through the rock, but both the ends are open. A channel for water runs along the side, conveying the pure element down from the mountain to Seleucia. The whole rock above is full of artificial cavities, formed for some purpose now unknown. A Greek inscription of five lines is visible on the S. side of the cavern. Towards the sea are some catacombs, ornamented with pilasters, cornices, and mouldings.

Jackson, in his "Journey from India," considers Bagdad as the site of the ancient Seleucia, and he says that several of the coins of Seleucus are found in Bagdad. The gold coin is worth about two guineas; it bears as strong an impression of the head as the ancient Roman coins, but has a long beard.

SELEUCIA, a town of Asia Minor, which was anciently in Cilicia; but in the 4th century of the Christian era, the province of Isauria was made to constitute a part of Cilicia; and this city became the metropolis of the province. The Notitia of Hierocles represents Seleucia as founded by Seleucus Nicanor, and as being one of the largest and richest towns of the East. The river Calycadnus was navigable near this city, and facilitated the commerce of the country. In the year 116, Seleucia threw off the Roman yoke; but Trajan sent thither a body of troops in the beginning of the year 117, who reduced it to subjection. However it again recovered its liberty, as we learn from a medal of Gordian and another of Philip, on which it is denominated *cleothera*, or free.

SELEUCIA, a large town of the Perfide, in the territory of Elymais, on the river Edyphonte, according to Strabo. It was also named *Soloe*.—Also, a town of Asia, in Pisidia, according to the Notitia of Hierocles. Appian relates that it was one of the nine towns built by Seleucus Nicanor, who gave it his own name.—Also, the name given to the town of Trallis, in Lydia. Pliny.—Also, an episcopal town of Asia, in Pamphylia.

SELEUCIA *Pieria*, a town of Asia, in Syria, situated on the coast of the Mediterranean sea, N.W. of the river Orontes,

Orontes, and near it, and S.W. of Antioch. According to Pliny, it was a free city.

SELEUCIA, the name which Seleucus gave to a town of Gadara, situated to the E. and beyond the sea of Tiberias. —Also, a town of Judea, in the half-tribe of Manasseh, on the other side of Jordan.

SELEUCIANS, SELEUCIANI, in *Ecclesiastical History*, a sect of ancient heretics, called also Hermiani.

Seleucus and Hermias taught, that God was corporeal; that the elementary matter was co-eternal with him; and that the human soul was formed by the angels of fire and air. They also denied, that Jesus Christ sat at the right hand of God; asserting that he had quitted the right, and had removed his throne into the sun.

SELEUCIDÆ, in *Chronology*; era of the Seleucidæ, or the Syro-Macedonian era, is a computation of time, commencing from the establishment of the Seleucidæ, a race of Greek kings, who reigned as successors of Alexander the Great, in Syria, as the Ptolemies did in Egypt.

This era we find expressed in the book of Maccabees, and on a great number of Greek medals struck by the cities of Syria, &c.

The rabbins and Jews call it the *era of contracts*, because, being then subject to the kings of Syria, they were obliged to follow their method of computing in all contracts.

The Arabs call it *therick dilaearnain*, era of two horns, which some say signify the era of Alexander the Great; because that prince bore two rams' horns on medals, in imitation of Jupiter Ammon, whose son he would needs be; but others understand it much better of the two kingdoms of Syria and Egypt, which were now cloven or divided, and of one single empire parted into two monarchies.

The grand point is to know the year in which the separation was made; or, which is the same thing, when Seleucus Nicanor, one of Alexander's captains, and the first of the Seleucidæ, established his throne in Syria.

Without detailing the various sentiments of various authors, it may suffice to observe, that, according to the best accounts, the first year of this era falls in the year 311 or 312 before Christ, which was twelve years after Alexander's death. See EPOCHÆ.

SELEUCIS, in *Ancient Geography*, a country of Asia, in Syria, which took its name from the city of Seleucia. It was also called *Tetrapolis*, on account of four celebrated towns contained in it, according to Strabo. This country extended southwards as far as Phœnicia.

SELEUCO BELUS, a town of Asia, in Syria; situated towards the river Orontes, W. of mount Belus, about N. lat. 55° 40'.

SELEUCUS, a town of Asia, in Syria, in the vicinity of Apamea.

SELEUCUS I., in *Biography*, surnamed Nicator, king of Syria, was son of a Macedonian named Antiochus, a captain under king Philip. Seleucus entered, when young, into the service of Alexander the Great, by whom he was raised to an important command, and after the death of that conqueror, he was placed by Perdiccas at the head of the cavalry. On the division of the provinces made by Antipater, the government of that of Babylon was entrusted to Seleucus, in which situation he opposed the advance of Eumenes against Antigonus. When, however, that leader, after the death of Eumenes, marched to Babylon, he shewed such a hostile disposition towards Seleucus, that the latter thought it necessary to take refuge with Ptolemy, king of Egypt. Upon the defeat of Demetrius, the son of Antigonus, by Ptolemy, Seleucus recovered his government of Babylon, and added to it Media and Susiana, which he wrested from Nicanor,

the governor, for Antigonus. Demetrius afterwards expelled Seleucus from Babylon, but he soon returned, and durably established his authority. He then proceeded with a powerful army to the East, conquered and slew Nicanor, and marching through Persia, Bactria, and Hyrcania, subdued those countries, and the other provinces which had formed part of Alexander's empire on this side the Indus. From these important victories he assumed the name of Nicator; and the other successful captains of Alexander taking the title of kings in the year 306 B.C., he followed their example. The historical era of the Seleucidæ, however, commenced six years earlier than this, viz. in the year 312 B.C., when he recovered Babylon. He now marched to regain the districts of India Proper, conquered by Alexander, but he was opposed by so large a force, that he thought it expedient to leave him in possession, on condition of being supplied by him with 500 elephants. One reason of his making this treaty was the necessity of joining with Cassander, Lyfimachus, and Ptolemy, in order to reduce the overgrown power of Antigonus, which menaced the independence of them all. This purpose was effected by the great battle of Ipsus, in which Antigonus lost his life. His dominions were shared by the four confederate monarchs, previously to which Seleucus had seized the province of Upper Syria, and founded the famous city of Antioch. He also built other cities in the same province, to which he gave family names, as Seleucia, from himself; Apamea, from his wife; and Laodice, from his mother; and as he was a great founder of cities in all his territories, he filled Asia with places bearing the names of his family. After this, he built Seleucia on the Tigris, which became one of the most famous cities in the East, and was the cause of the desertion and ruin of Babylon. In many of his new cities he settled colonies of the Jews, whom he endowed with ample privileges, and to him was owing their establishment in the Asiatic provinces to the west of the Euphrates. When he was advanced in years, he is said to have resigned to his son Antiochus, his wife Stratonice, and with her he resigned to the prince all the provinces of Upper Asia. Seleucus and Lyfimachus were now the only survivors of Alexander's captains, and a domestic tragedy having taken place in the family of the latter, some of its members took refuge in the court of Seleucus, whom they urged to make war upon Lyfimachus. He accordingly invaded, with a very powerful army, the territories of Lyfimachus in Asia Minor. That prince crossed the Hellespont to protect them, and a most bloody battle was fought between the rivals in Phrygia, in which Lyfimachus was slain, in the year B.C. 281. Seleucus took possession of his dominions, but did not long enjoy the fruits of victory, for as he was marching into Macedonia, seven months after, he was treacherously murdered by Ptolemy Ceraunus, one of the fugitives from the court of Lyfimachus. Seleucus died in the 43d year from the death of Alexander, and in the 73d year of his age. He was a prince of splendid qualities, mild and equitable in his government, and a patron of letters and learned men. Univer. Hist.

SELEUCUS II., surnamed Callinicus, succeeded his father Antiochus Theos, in the year 246 B.C. His mother Laodice having cruelly put to death Berenice, the second wife of Antiochus, and her son, Ptolemy Euergetes, the brother of Berenice, marched into Syria, slew Laodice, and took possession of great part of the Syrian empire. After his return to Egypt, Seleucus recovered part of his lost dominions; but being defeated by Ptolemy, he applied for aid to his brother. This union brought about a truce with Ptolemy, but the two brothers then quarrelled, and Seleucus was defeated

feated by Antiochus in a great battle at Ancyra. The war between them was carried on with great inveteracy, while the empire was invaded on one side by Eumenes and Attalus, kings of Pergamus; and on the other, Arsaces, founder of the Parthian monarchy, was making a progress in Hyrcania. Seleucus was at length delivered from the hostility of his brother, who was detained captive in Egypt, whither he had fled, and he then turned his arms against Arsaces, but in a great battle that was fought he was defeated and taken prisoner. He died in Parthia, in consequence of a fall from his horse, in the year 226 B.C.

SELEUCUS III., surnamed Ceraunus, eldest son of the preceding, succeeded him on the throne. He was a weak and incapable prince, and after a reign of three years he was poisoned by two of his chief officers, while engaged in an expedition against Attalus.

SELEUCUS IV., surnamed Philopator, succeeded his father Antiochus the Great, in the year 187 B.C. He was favourable to the Jews during the greatest part of his reign, but near the close of it he employed Heliodorus to carry off the treasures of the temple at Jerusalem, as is mentioned in the second book of Maccabees. He was afterwards poisoned by Heliodorus, who usurped his throne. This event occurred in the year 176 B.C. There were several other kings of the name of Seleucus, but they did nothing worthy of notice.

SELEZNEVA, in *Geography*, a town of Russia, in the government of Irkutsk, on the Ilim; 28 miles S. of Ilimsk.

SELF-ABUSE. See SELF-POLLUTION.

SELF-Defence, in *Law*. With regard to the defence of one's self, or the mutual and reciprocal defence of such as stand in the relations of husband and wife, parent and child, master and servant, it is observed, that, in these cases, if the party himself, or any of these his relations, be forcibly attacked in his person or property, it is lawful for him to repel force by force; and the breach of the peace, which happens, is chargeable upon him only who began the affray.

Self-defence, therefore, as it is justly called the primary law of nature, so it is not, nor can it be in fact, taken away by the law of society.

In the English law, particularly, it is held an excuse for breaches of the peace, nay, even for homicide itself; but care must be taken, that the resistance does not exceed the bounds of mere defence and prevention, for then the defender would himself become an aggressor. Blackst. Com. vol. iii.

SELF-Examination. See EXAMINATION.

SELF-Heal, in *Botany*. See PRUNELLA.

SELF-Heal, in the *Materia Medica*. The greater self-heal, with an undivided leaf, grows wild in pasture grounds, and flowers in June and July. It has been reckoned among the vulnerary plants, and is accounted serviceable in all sorts of wounds and putrid ulcers. It is restraining, and good for inward bleedings, and making bloody water; and has been much used in gargles, for ulcers in the mouth, throat, or gums, either in juice, or in a strong decoction.

Its virtues do not appear to be very great; its austere or bitterish taste is more sensible in the flowery tops than in the leaves; though the latter are generally directed for medicinal use.

Self-heal is also a name given to fanicle.

SELF-Love, in *Ethics*, is that principle, or passion, which leads a man to desire and pursue his own happiness. It is contradistinguished from benevolence. See *Mental PHILOSOPHY*.

SELF-Opens, a term used by the miners in the north of England to express certain natural cavities, or chambers, which are frequently met with, some near the surface, some at very great depths, some small, and others very large.

These are of various figures, and often run into strange sinuses. Dr. Lister, in accounting for the origin of earthquakes, supposes the whole crust of the earth to be more or less hollowed in this manner; which he also argues for, from the streams of waters which arise in large quantities from the sides of mountains, and must have communication with these self-opens, and supplies from them.

These natural hollows the doctor thinks to be the means of continuing, and propagating earthquakes; the first cause of which he ascribes to the breath of the pyrites, which he also says is the pyrites itself *tota substantia*. This he observes takes fire of itself, on being exposed to the air in our sight, and may do so, from various other causes underground. The sulphureous smell of the air and waters before and after earthquakes, in the places where they happen, seems a proof that they owe their origin to some such sulphureous matter as this stone; and the rolling and desultory noise of an earthquake seems also to shew that it is not expanded every way at once, but is propagated through a chain of these subterranean hollows.

It is not necessary that we should suppose a continued chain of them, from the place where the earthquake begins to be felt to the spot where it ends; but if there are many of them irregularly scattered about the earth, the force of the explosion will be sufficient to burst through the solid parts between, and open a passage from one to the other, which may continue open no longer than the force continues, and after the shock is over, close together again, so as to leave no trace where it was.

Our miners not only find the natural caverns, but they also find them often full of what they call *fire damps*, which are inflammable vapours, of the very nature of those which he supposes to occasion earthquakes; and when fired make the same explosions, and cause the same effects in a certain degree. These sometimes require a candle, or other actual fire, to come in contact, in order to kindle them; but sometimes they are found kindled of themselves, and flaming on the surface of the waters, in the bottoms of the pits, or at the fissures of the coal. Phil. Trans. N° 157.

SELGA, or SELGE, in *Ancient Geography*, a considerable and well-peopled town of Asia, in Pisidia. It was colonized from Lacedæmon.

SELGENFELT, in *Geography*, a town of Prussia, in the circle of Natangen; 3 miles S. of Königberg.

SELGENTHAL, a town of Germany, in the circle of the Lower Rhine; 3 miles N.W. of Burken.

SELGOVÆ, in *Ancient Geography*, a people of Britain, seated to the west of the Gadeni, in the countries now called Eskdale, Annandale, and Nithsdale, lying along the shores of the Solway Frith, which is believed to have derived its name from that of this ancient British nation. Mr. Baxter supposes that the name of these people was compounded of the two British words Sal Giu, which signify salt waves, alluding to the Solway Frith, with which the coasts of their country were washed. But Dr. Macpherson thinks it more probable, that the name was derived from the British word Sealg, which literally signifies hunting, and metaphorically theft. The Selgovæ became first acquainted with the Romans, when Agricola marched his army through their country into Caledonia, in the second or third year of his government in Britain; at which time they made their submission to that victorious general. From that period they were alternately under the dominion of the Romans, or enjoyed freedom, as that people extended or contracted the limits of their empire in this island. The Romans had several stations and camps in the country of

of the Selgovæ, of which some vestiges are still remaining.

SELI, in *Botany*, a word formed by an abbreviation of the word *sefel*, and signifying the same plant.

SELIA, in *Ancient Geography*, a town of Hispania, in the interior of Bætica. It belonged to the Turduli, according to Ptolemy.

SELIKINSKO, in *Geography*, an ostrog of Russia, in the government of Tobolsk, on the Enisei; 260 miles N.N.W. of Turuchanfk. N. lat. $69^{\circ} 55'$. E. long. $85^{\circ} 14'$.

SELICHA, a name given by the Arabians to a kind of cinnamon.

SELICO, or SELUCO, in *Geography*, a town of Africa, on the north side of the Gambia, in Mandingo.

SELIGENSTADT, a town of Germany, in the circle of the Lower Rhine, and electorate of Mentz, formerly imperial, on the Maine; 12 miles E.S.E. of Frankfort on the Maine. N. lat. $49^{\circ} 59'$. E. long. $8^{\circ} 46'$.

SELIGENTHAL, a town of Germany, in the county of Henneberg; 3 miles N. of Smalkalden.

SELIGER, a lake of Russia, in the government of Tver; 80 miles W.N.W. of Tver.

SELIGONION, in *Botany*, a name by which some authors have called piony.

SELIM, in *Ancient Geography*, a town of Palestine, in the tribe of Judah, on the southern side along the frontiers of Edom, according to Joshua. This was afterwards comprised in the tribe of Simeon. See SALEM.

SELIM I., in *Biography*, a Turkish emperor, was the second son of Bajazet II. In 1511, being governor of Trebizond, he rebelled against his father, and marched to Constantinople, where he was defeated and obliged to seek his safety in a precipitate flight. The janizaries, however, favouring him, Bajazet was forced to resign his crown to him, and soon after died, probably by poison. Selim ascended the throne in 1512, being at that time about 46 years of age. His first step was to proceed against his eldest brother Achmet, who was at the head of some troops in Asia. He defeated and put him to death, which was soon after the fate of another brother. Selim then invaded Persia with a numerous army, and defeating Shah Ismael in a great battle, entered the city of Tauris. He afterwards annexed Diarbekir to the Turkish empire; and one of his officers recovered Bosnia, which had been conquered by the Hungarians. In 1517 Selim turned his arms against the sultan of Egypt, and obtained a victory over him near Aleppo, the sultan being slain in the engagement. Aleppo and Damascus submitted to Selim after this event, and he prepared to march into Egypt. Arriving in the neighbourhood of Cairo, a very bloody battle ensued between him and Tuman Bey, which terminated in a total defeat of the Mamelukes. Cairo, after a desperate resistance, was taken, and all Egypt submitted. Selim returned to Constantinople, and, elated with his successes, made a vow that he would not lay down his arms till he had put an end to the Persian empire. His career was, however, stopped by disease, which terminated in his death at a village in Thrace, in 1520. Selim was one of the most able and vigorous of the Ottoman sovereigns, and made greater additions to the Turkish empire than any one of his predecessors. He was, at the same time, unprincipled in his projects of ambition, and had all the ferocious cruelty of an eastern despot.

SELIM II., Turkish emperor, son of Solyman I., succeeded his father in 1566. Being of an indolent disposition, and extremely intemperate, the actions of his reign are

those of his viziers and generals. Of these the principal was the capture of Cyprus, then belonging to the Venetians, which, after a vigorous resistance, was reduced in 1571. The European powers, who had combined for its relief, gained, in the same year, the famous naval battle of Lepanto, which nearly ruined the Turkish marine. Notwithstanding this success, the Venetians were obliged to make peace with the Turks in 1574, upon very disadvantageous terms. During the remainder of Selim's reign, the affairs of the Ottoman empire were prosperous. Selim died at the age of 52, probably of intemperance. He had many good qualities, but was slothful and sensual.

SELIMABAD, in *Geography*, a town of Hindoostan, in Bengal; 12 miles S.S.E. of Burdwan. N. lat. $23^{\circ} 5'$. E. long. $87^{\circ} 48'$.

SELIMBRIA. See SELIVRA.

SELIME', a village of Nubia, on the route of the Soudan caravan from Assiut to Darfur; 42 miles S. of Sheb.

SELIMPOUR, a town of Bengal; 24 miles N.W. of Burdwan. N. lat. $23^{\circ} 23'$. E. long. $87^{\circ} 35'$.

SELIN, a town of Africa, in the kingdom of Galam; 15 miles S. of Galam.

SELINA, in *Ancient Geography*, *Ilan-Adassi*, or Isle of Serpents, an island of the Euxine sea, near the mouth of the Danube: called *Parasitus*, or *Paracadium*. Some authors have denominated it *Melastia*.

SELINAGUR, in *Geography*, a town of Hindoostan, in Oude, on the Ganges, opposite to Furruckabad.

SELINCOURT, a town of France, in the department of the Somme; 18 miles W. of Amiens.

SELINE, a river of Silesia, which runs N.W. into the Loh, 7 miles S. of Breslau.

SE-LING, a town of China, of the second rank, in the province of Quang-si. N. lat. $21^{\circ} 55'$. E. long. $106^{\circ} 29'$.

SELINGUE. See SELENGA.

SELINO, a province of the island of Crete, south of that of Kissamos, which takes its name from that of a small town, built on the south coast of the island, in the situation formerly occupied by Lissa or Lissus, a place of small importance, mentioned by Ptolemy. It is entirely mountainous, but very fertile. It furnishes a little silk, honey, wax, and a tolerably large quantity of fruits, such as cherries, apricots, peaches, pears, and oranges. This is the only province in which the chestnut-tree is cultivated, and it thrives well on the schistose hills and mountains of this country. The chestnuts are carried to Canea, Retimo, and Candia. A quantity is also annually exported to Syria. Oil, however, is the principal commodity of Selino; and it is reckoned better than any other in the island. The merchants of Canea generally establish their speculations on the quantity and quality of the oils of Selino. Wine, wheat, and barley, are not plentiful. The population of the Turks is estimated at a fourth or fifth of the inhabitants. Olivier.

SELINUM, in *Botany*, an ancient generic name of Theophrastus and Dioscorides, whose *Σελινον* is said to be derived from *παρεα το εν ελει φουσθαι*, on account of its growing in mud, whence Homer's *ελεοθερεπον σελινον*. De Theis says that *Selinum* is derived from *σεληνη*, the moon, because of the shape of its growing seeds; and that it is the foundation of many other compound names of umbelliferous plants among the Greeks, as *ορεοσελινον*, *πετροσελινον*, &c.—Linn. Gen. 133. Schreb. 184. Willd. Sp. Pl. v. 1. 1396. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 303. Ait. Hort. Kew. v. 2. 131. Pursh 127. Juss. 223. Lamarck II. illustr. t. 200. Gærtn. t. 21.—Class and order, *Pentandria*

tandria Digynia. Nat. Ord. *Umbellata*, Linn. *Umbellifera*, Juss.

Gen. Ch. *General umbel* of numerous, flatly-spreading rays; *partial* similar. *General involucre* of many, lanceolate, linear, reflexed leaves; *partial* similar, spreading, the length of the flower. *Perianth* scarcely discernible. *Cor.* *universal* uniform; all the flowers fertile; *partial* of five, heart-shaped, equal petals. *Stam.* Filaments five, capillary; anthers roundish. *Pist.* Germen inferior; styles two, reflexed; stigmas simple. *Peric.* Fruit compressed or flat, oval, oblong, striated on each side in the middle, separable into two parts. *Seeds* two, oval-oblong, flat on both sides, striated in the middle, their sides membranous.

Obf. The form of the seeds is liable to variation, and so is the number of leaves in the involucre.

Eff. Ch. Fruit oval-oblong, compressed, striated down the middle. Involucres reflexed. Petals heart-shaped, uniform.

1. *S. sylvestre*. Wood Milky Parsley. Linn. Sp. Pl. 350. Fl. Dan. t. 412. ("Thesselinum Plinii; Lob. Ic. 711." Tournef. Inst. 319.)—Stem smooth. Root spindle-shaped, much divided.—Native of Denmark, France, and Piedmont. The whole herb is somewhat milky. *Stems* numerous, smooth, striated. *Leaflets* linear. *Flowers* white, in spreading umbels. *Seeds* oval-oblong, with three, elevated, approximating furrows.

2. *S. palustre*. Marsh Milky Parsley. Linn. Sp. Pl. 350. Engl. Bot. t. 229.—Herb milky. Root generally single. Stem solitary. Styles much divaricated after flowering. Petals involute.—Native of marshes in Great Britain and the north of Europe, flowering in July. Root perennial, somewhat spindle-shaped. Stem solitary, erect, four feet high, hollow, furrowed, smooth, leafy, bright purple at the base, branched upwards. Leaves alternate, about five or six on the stem, remote, twice or thrice oppositely pinnate, and cut into narrow, pointed, smooth segments. Stipules sheathing, reddish. Umbels large, horizontal, compound, composed of white flowers, on pale purplish footstalks. "The whole plant abounds with a white, bitter, fetid juice, of the consistence of cream, which soon dries to a brownish resin. The Russians are said to use the root instead of ginger."

3. *S. austriacum*. Austrian Selinum. Willd. n. 3. Jacq. Austr. v. 1. t. 71.—Stem furrowed. Leaves of the involucre wedge-shaped, much divided.—Native of Austria and the south of Europe, flowering in July. Root perennial, containing a yellowish-white milk. Stem striated, smooth. Radical leaf divided by a round stalk into three branches, which are again subdivided. Leaves dark green above, paler beneath. Flowers yellowish-white, forming a compound umbel, which is usually made up of about twenty partial ones.

4. *S. sibiricum*. Siberian Selinum. Willd. n. 4. Retz. Obf. fasc. 2. 16.—Leaves triply pinnate. Involucres faded, of nine leaves.—Native of Siberia. Root biennial, spindle-shaped. Stem erect, three feet high, hollow, striated, glaucous. Leaves triply pinnate; leaflets acute, on compressed stalks which are channelled on the upper side. Flowers white; the general umbel composed of twenty or thirty partial ones. Its root smells like that of *Daucus Carota*.

5. *S. Caruifolia*. Caraway-leaved Selinum. Linn. Sp. Pl. 350. Jacq. Austr. v. 1. t. 16.—Stem furrowed, acutely angular. General involucre none. Leaflets lanceolate, cut, callous and pointed at the tip.—Native of Austria and Siberia. It flowers at Kew in July and Au-

gust. Root perennial, fibrous, both tasteless and scentless. Stem almost three feet in height, pale green, simple, occasionally with one branch. Leaves pinnate in a compound manner, terminating in a white point. Flowers white, with a tinge of red on the under side; the general umbel compact, consisting of about twenty partial ones.

6. *S. Chabrai*. Carrot-leaved Selinum. Willd. n. 6. (*S. caruifolia* Chabrai; Jacq. Austr. v. 1. t. 72.)—Stem round, striated. General involucre none. Sheathes of the leaves loose. Leaflets thread-shaped, linear.—Native of Switzerland and Germany. First introduced at Kew by E. Daval, esq., in 1791, where it flowers in July and August. Stems about a foot high, smooth, channelled. Radical leaves resembling those of the last species; stem-leaves simply pinnate. Flowers white, slightly purplish on the outside. Partial umbels unequal in size, much smaller than in the last species, generally about ten in number. Villars has observed that this species is as it were intermediate between *Peucedanum* and *Selinum*.

7. *S. Seguieri*. Fennel-leaved Selinum. Linn. Suppl. 179. Jacq. Hort. Vind. v. 1. t. 61.—Stem nearly round, furrowed. General involucre none. Leaflets trifid, linear, pointed.—Native of Italy, flowering in July. Stem much branched, four feet high, obscurely striated at the top. Branches opposite. Leaves opposite, triply pinnate, spreading; leaflets linear, acute, decurrent. Flowers white, the general umbel large and handsome, composed of about forty partial ones.

8. *S. Monnieri*. Annual Selinum. Linn. Sp. Pl. 351. Jacq. Hort. Vind. v. 1. t. 62.—Umbels crowded together. General involucre reflexed. Seeds with five membranous ribs.—Native of the south of France, flowering in July and August. Root annual. Stem erect, two or three feet high, sometimes purplish, with numerous streaks. Leaves smooth, bipinnate; leaflets deeply pinnatifid. Flowers greyish-white, forming a close compact general umbel.

9. *S. decipiens*. Madeira Shrubby Selinum. Willd. n. 9. "Schrader. Sert. Hannov. fasc. 3. 23. t. 13."—Stem woody, naked below. Lower leaves bipinnate. Leaflets lanceolate, entire, unequally serrated.—Native of Madeira, flowering in June and July. Stem an inch thick. Leaves resembling those of *Angelica*, wide and bipinnate. Sheathes widened, toothed. Involucre many-leaved.

10. "*S. canadense*. Canadian Selinum. Pursh v. 1. 192. (*Apium bipinnatum*; Walt. Fl. Carn. 115.)—Herb very smooth, shining. Leaves bipinnate. Leaflets much divided; segments lanceolate. Fruit oval.—On the mouths of large rivers from Canada to Carolina, flowering in July. Flowers white." This species is adopted on the authority of Mr. Pursh, who has referred it from *Apium* to the present genus.

SELINUM, in *Ancient Geography*, a town of Egypt, in the Thebaid, on the other side of the Nile, between Panum and Antea, according to the Itinerary of Antonine.

SELINUS, or SELINUNTUM, a town of Sicily, south-east of Mazara, on the southern coast. It was founded by a colony from Hybla, another town of Sicily, 100 years before the destruction of that city by Gelon. In its vicinity were many palm-trees, whence arose the epithet of *palmosa* given to it by Virgil. It was destroyed, a little before Himera, by Hannibal, who took it by storm, and treated the inhabitants with great barbarity, massacring a great number, and carrying the rest into captivity. The inhabitants had consecrated to the Olympian Jupiter a treasure, in which, among other rarities, was a statue of Bacchus, the face, hands, and feet of which were made of ivory. It appears to have been destroyed in the year of Rome

Rome 350: its ruins are still visible. It took its name from that of a small river, on the banks of which grew parsley, called in Greek *σελινον*.

SELINUS, a river of Sicily, the mouth of which is placed by Ptolemy on the southern coast of the island, between the promontory of Lilybæum and the mouth of the river Mazara.—Also, a river of the Trachæan Cilicia, the mouth of which is placed by Strabo between a fortified place called Laertes, and a rock named Cragus.—Also, a river of Achaia, which commenced in mount Lampia, and ran from south to north, and passed to the east of Egium.—Also, a river of the Peloponnesus, in the Elide: it watered the territory of Scillunte, according to Pausanias.—Also, a river of Asia Minor, in Ionia: it ran near the temple of Diana, according to Strabo.—Also, a river of Myſia, which traversed the town of Pergamus, and after having watered the territory of Caicus, flowed into that river.—Also, a town of Cilicia, where Trajan died in the year 117, after his return from the Parthian war.—Also, a port of Egypt, upon the coast, of the nome of Libya, between Zagylis-Villa and Trisfarchi-Villa, according to Ptolemy.

SELION of Land, *Selio Terræ*, is derived from the French, *seillon*, which signifies a ridge of land, or ground arising between two furrows, and contains no certain quantity, but sometimes more and sometimes less. Therefore Crompton says, that a *selion* of land cannot be in demand, because it is a thing uncertain.

SELISIA, in *Geography*, a river of Friuli, which unites with the Cobara, and forms the Meduna.

SELIUM, in *Ancient Geography*, a town of Hispania, in Lusitania, in the interior of the country. Ptolemy.

SELIVRA, or **SELIMBRIA**, in *Geography*, a sea-port town of European Turkey, in Romania, situated on the north side of the sea of Marmora, and having an old castle, formerly very strong, and houses near it, called the "Upper Town." In the suburbs is an imperial granary, where the corn of the province is deposited. It is the residence of a Greek archbishop; 34 miles W. of Constantinople. N. lat. 40° 52'. E. long. 28° 12'.

SELKA, a town of Hindoostan, in the circar of Surgooja; 5 miles S.S.W. of Surgooja.

SELKAKARI, a small island on the east side of the gulf of Bothnia. N. lat. 65° 36'. E. long. 24° 54'.

SELKIE, the name in Zetland for a seal. Many of these are found in that island.

SELKIRK, ALEXANDER, in *Biography*, whose adventures have given rise to a well-known and highly esteemed romance, was born at Largo, in Fifeshire, in Scotland, about the year 1676, and was brought up to the sea-service. He left England in 1703, in the capacity of sailing-master of a small vessel, called the Cinque-Ports-Galley, Charles Pickering captain; and in the month of September, the same year, he sailed from Cork, in company with another ship of 26 guns and 120 men, called the St. George, commanded by captain WILLIAM DAMPIER (see his article), intended to cruise against the Spaniards in the South sea. On the coast of Brasil, Pickering died, and was succeeded in the command by lieutenant Stradling. They proceeded round Cape Horn to the island of Juan Fernandez, whence they were driven by the appearance of two French ships of 36 guns each, and left five of Stradling's men on shore, who were taken off by the French. Hence they sailed to the coast of America, where Dampier and Stradling quarrelled, and separated by agreement. This was in the month of May 1704; and in the following September, Stradling came to the island of Juan Fernandez, where Selkirk and

his captain having a quarrel, he determined to remain there alone. But when the ship was ready to sail, his resolution was shaken, and he desired to be taken on board; but now the captain refused his request, and he was left with his clothes, bedding, a gun, and a small quantity of powder and ball, some trifling implements, and a few books, with certain mathematical and nautical instruments. Thus left sole monarch of the island, with plenty of the necessaries of life, he found himself at first in a situation scarcely supportable; and such was his melancholy, that he frequently determined to put an end to his existence. It was full eighteen months, according to his own account, before he could reconcile himself to his lot. At length his mind became calm, and fully reconciled to his situation: he grew happy, employed his time in building and decorating his huts, chasing the goats, whom he soon equalled in speed, and scarcely ever failed of catching them. He also tamed young kids, and other animals, to be his companions. When his garments were worn out, he made others from the skins of the goats, whose flesh served him as food. His only liquor was water. He computed that he had caught, during his abode in the island, about 1000 goats, half of which he had suffered to go at large, having first marked them with a slit in the ear. Commodore Anson, who went there 30 years after, found the first goat, which they shot, had been thus marked; and hence they concluded that it had been under the power of Selkirk. Though he constantly performed his devotions at stated hours, and read aloud, yet when he was taken from the island, his language, from disuse of conversation, had become scarcely intelligible. In this solitude he remained four years and four months, during which only two incidents occurred which he thought worthy of record. The first was, that pursuing a goat eagerly, he caught at the edge of a precipice, of which he was not aware, and he fell over to the bottom, where he lay some time senseless; but of the exact space of time in which he was bereaved of his active powers he could not form an accurate estimate. When, however, he came to himself, he found the goat lying under him dead. It was with difficulty that he could crawl to his habitation, and it was not till after a considerable time that he entirely recovered from his bruises. The other event was the arrival of a ship, which he at first supposed to be French, but upon the crew's landing, he found them to be Spaniards, of whom he had too great a dread to trust himself in their hands. They, however, had seen him, and he found it extremely difficult to make his escape. In this solitude Selkirk remained until the 2d of February 1709, when he saw two ships come to the bay, and knew them to be English. He immediately lighted a fire as a signal, and he found, upon the landing of the men, that they were two privateers from Bristol, commanded by captains Rogers and Courtney. These, after a fortnight's stay at Juan Fernandez, embarked, taking Selkirk with them, and returned by way of the East Indies to England, where they arrived on the 1st of October 1711; Selkirk having been absent eight years. The public curiosity being much excited, he, after his return, drew up some account of what had occurred during his solitary exile, which he put into the hands of Defoe, who made it the foundation of his well-known work, entitled Robinson Crusoe. The time and place of Selkirk's death are not on record. It is said, that so late as the year 1798, the chest and musket, which Selkirk had with him on the island, were in possession of a grand nephew, John Selkirk, a weaver in Largo, North Britain. The circumstances of Selkirk's seclusion from human society, during his stay on the desolate island, have given birth to a

fine poem by Mr. Cowper, with which all our readers are no doubt well acquainted. Biog. Brit.

SELKIRK, in *Geography*, a royal borough town, and a parish, in the county of Selkirk, Scotland. It derived its name from the Celtic word Scheleckgrech, which signifies the kirk in the wood; expressing thus in one word the situation of the place itself, and the state of the surrounding country, which in former times was one continued forest. From the circumstance of its being placed on the summit of a considerable eminence, Selkirk enjoys an extensive prospect in all directions, especially up and down the river Ettrick. The inhabitants boast greatly of the spirit displayed by their ancestors at the celebrated battle of Flodden. Of a hundred citizens of Selkirk, who followed the fortune of their prince on that occasion, it appears that several survived the contest, and even carried off some spoils and trophies. The English, in resentment, reduced their town to ashes. But, on the other hand, king James V. granted to them a thousand acres of the forest; the trees for rebuilding their houses; and the property as the reward of their heroism. These borough lands are now worth about 1500*l. per annum*, and are divided into a great number of small properties; a circumstance which tends to damp that spirit for commerce and manufactures, by which the inhabitants of towns are in general distinguished. On the day on which the magistrates annually survey this tract, a standard, taken from the English in the field of Flodden, is carried before the corporation of weavers, a member of which was the captor. It may be added, that the sword of William Brydon, the town clerk, who led the citizens to the battle, and who is said to have been knighted for his valour, is still in the possession of a citizen of Selkirk, his lineal descendant.

Selkirk has a weekly market held on Tuesday, and six annual fairs; two in March, and one in July, August, October, and December. As a royal borough, it unites with Lanark, Linlithgow, and Peebles, in sending one member to parliament. The corporation consists of two bailies, a dean of guild, treasurer, and ten counsellors, and possesses a revenue of about 300*l. per annum*, drawn from that portion of the borough lands which has not been alienated in fee to private individuals. The parish, which is about ten miles square in extent, lies partly in Selkirkshire and partly in Roxburghshire; and, according to the parliamentary returns of 1811, contains 440 houses, and a population of 2466 persons, of whom about 1000 are resident within the borough.

The principal object of interest in this vicinity is Newark castle, situated on a peninsula, formed by the stream of Yarrow, which has here cut its turbid course through a deep gulf of rugged rocks, enveloped in wood, and presenting a most "fantastically wild scene of grandeur and beauty." The castle is now a ruin, but enough of it yet remains to evince its ancient strength and importance. It is generally supposed to have been the birth-place of Mary Scot, the flower of Yarrow. Beauties of Scotland, vol. ii. 8vo. 1805. Statistical Account of Scotland, by Sir John Sinclair, vol. ii. 1792.

SELKIRKSHIRE, one of the southern counties of Scotland, is situated between 55° 22' and 55° 43' N. lat. and between 2° 50' and 3° 20' W. long. from the meridian of Greenwich. It is bounded on the W. by the county of Dumfries; on the E. by Mid-Lothian and Roxburghshire; on the S. by the county last mentioned; and on the N. by that of Peebles. Its greatest length, from the source of Ettrick water to the junction of Gala and Tweed, is 27 miles, and its greatest breadth from Borthwick brae to Glen-

faxburn, about 17 miles. Taking, at a medium, 20 miles for its length, and 12 for its breadth, its contents may be calculated at about 240 square miles, or 153,600 acres. The proportion of arable land actually occupied in husbandry may be computed at about 6880 Scotch acres.

General Aspect of the County.—With the exception of a few vallies, the whole of Selkirkshire is mountainous, and presents elevations of considerable height, Meade, in the parish of Galashiels, being 1480 feet above the level of the sea. In the parish of Ettrick, the most remarkable hills are the Ward Law and Ettrick Penn: the former rises 1000 feet above the level of the sea, the latter 2200. In the parish of Yarrow, the hills are in general steep and towering: the most remarkable are those called "Blackhouse heights." The highest point of elevation above the level of the sea measures 2370 feet. For the most part, the mountains exhibit a green appearance; though upon some few there is a considerable quantity of heath. Toward the source of the waters of this county, that is, on its western extremity, the hills are more green, and are covered with long coarse grass. Towards their junction with the Tweed they have a greater mixture of heath, and the grass is shorter. On the north side of the Tweed, some of the hills are covered with loose stones, but none of them are very rugged or barren of herbage, or interrupted by mosses. Bordering on Minchmoor, over which was the old road from Peebles to Selkirk, their aspect is bleak and barren, and forms a striking contrast with the green hills on the opposite sides of the Yarrow and the Tweed.

Rivers and Lakes.—The Tweed, Ettrick, and Yarrow, flow through this county. The Tweed enters it near the ancient seat of Elibank, and flows through it for nearly ten miles, along a well-cultivated and fertile but narrow valley. At the eastern corner of the county it receives the Gala, a small water, which rises in Mid-Lothian, and which forms the boundary of Selkirkshire for five miles. Yarrow water rises near the western extremity of the county, and flowing through the Loch of Lows, and St. Mary's Loch, augmented by many smaller waters, joins the Ettrick about a mile above Selkirk. From the nature of its source, lochs, and from the circumstance of its receiving in its course many additional streams from the hills, the Yarrow, in time of high winds and rain, is rapidly flooded, and rendered impassable; but, from its rapid descent, it as rapidly subsides.

The Ettrick also takes its rise in the western angle of the forest, and running in an almost parallel direction with the Yarrow, unites with it about a mile above; they fall into the Tweed three miles below Selkirk, after a course of 30 miles. These waters, as they pass through this county, form many beautiful windings. Near their source they are hemmed in on each side by high towering hills; but as they approach their confluence with the Tweed, the expanse between the hills becomes wider and more open; and they flow through fertile vallies, in a broader channel, with a less rapid stream. For a considerable way above their junction, they are finely fringed with natural and artificial wood; but the extensive forests which once beautified and adorned their banks, and from which the country obtained the appellation of *Ettrick forest*, are now almost entirely destroyed. Every stream abounds with trout; and for a considerable way up the Ettrick and Yarrow, salmon are caught in large quantities. Ale water takes its rise from the Kingmoor loch, but only runs in this county for a short way; in some places passing out of it into Teviotdale, and in others forming its boundary. Borthwick water also constitutes part of its boundary. The hills are every where intersected by small streams

streams called *burns*. These, flowing in a deep bed, form glens or hollows, provincially called *hopes*, which afford shelter during the night, and in stormy weather, to the sheep in this pastoral district, and produce richer grass than the exposed sides of the hills. When the country was covered with wood, these glens must have afforded much beautiful scenery. In the south-west district of the county are a number of small lakes, not however worthy of description. The two already mentioned, *viz.* the Loch of the Lows, and St. Mary's Loch, lie contiguous, being separated only by a narrow neck of land. The first is very small, but the latter extends six miles in circumference, and one mile in breadth. Both of them are surrounded by high and steep hills, and abound with pike and perch.

Soil.—The soil of the sheep-walks, with some exceptions, is found and dry, generally from its lying on a bottom of gravel, granite, or whinstone; and even a good deal of it either inclining towards clay, or incumbent on clay or tilth, is prevented from retaining a hurtful quantity of water, by its steepness, and the firm consistence of its surface. There is very little pure clay in the whole country; and most of the land where a mixture of it appears, or where it forms part of the substratum, lies on the sides of the hills, nearly at an equal distance from their summits and the vallies below. There are some, though very few, marshy spots near the sides of rivers, and on the tops of high mountains. There is, indeed, an extensive flat, in an elevated situation, between the waters of Ettrick and Borthwick, of a soft and spongy nature, and full of morasses, but this may be considered as the only exception to the general assertion that deserves to be noticed. Heath grows vigorously on dry soil, but becomes rare and stunted, according to the wetness of the land, and in very wet land disappears altogether. Detached portions of it are found in every corner. It is only on the higher grounds, towards the sources of the waters, that the mossy soil prevails; sometimes appearing in its native dark and sterile hue, but more frequently presenting a thin sward of beautiful and tender grass, through which the feet of cattle sink more or less, according to the depth of the mossy substance, and the quantity of rain it has imbibed. It is in such places, chiefly, that the plant abounds which is called *moss*, of whose leaves and root sheep are extremely fond early in spring, when other food is scarce. The soil of the small part in tillage is light, dry, and easily managed. Even the few places which lie on tilth have so much declivity, that a little care in laying out and ploughing the ridges, carries off both the springs and the surface-water. Very little of it is sufficiently deep and strong for producing wheat. But nearly the whole of it is admirably adapted for turnips, clover, barley, and oats: peas, too, succeed very well: the white grains, though not large, have thin husks, are plump, and of an admirable quality. Turnips seldom fail, and clover is frequently raised in very weighty crops. These facts give the best idea of a sharp, warm, and kindly soil, which is rather, on the whole, however, deficient in depth. White clover appears, in every field that is surrendered to pasture, without having been sown, and indeed is found in all parts of the county where the soil is dry.

Climate.—In the lower part of the county there is not so much humidity as might be expected, from its elevation, and the numerous mountains with which it is surrounded. Less rain falls at Selkirk than at Wool, about five miles nearly due south of it; and only about half an inch more than at Hawkehill, near Leith. According to the Statistical Account of Scotland, (vol. ii. p. 438.) the mean quantity of rain which fell yearly in Wool parish was found to be $31\frac{1}{2}$ inches; the medium height of the barometer $29\frac{1}{2}$;

the medium of heat 43 degrees. Branhholm or Wool may be taken as a pretty just standard of the climate, about six or eight miles above Selkirk, on the waters of the Ettrick and Yarrow. There are few places, even in the highest part of the country, so very moist as Langholm; though, in proportion as it rises, there is a greater quantity of rain; the air becomes colder and more penetrating; frosts are more early and severely felt, and snow lies deeper and longer. The rays of the sun, reflected by the surrounding mountains on some vallies 600 feet above the ocean, excite a degree of heat that brings the crop very quickly to maturity. The number of springs that are obstructed in their course, forms marshes more or less deep and extensive. There are many morasses, some of them of an unknown depth; a good deal of mossy land; and several lakes. The moisture exhaled from the vast quantity of water collected in these, greatly increases the dampness of the atmosphere, and produces frequent mists and showers. Nor can this inconvenience be effectually obviated by the numerous drains which are daily making, though these must doubtless contribute to meliorate the climate. The general course of the weather and seasons is much the same as in Roxburghshire. See ROXBURGHSHIRE.

Mineralogy.—There are no metals, coal, lime, or free-stone, in any part of this county. But there is abundance of whinstone and granite. Mosses, formed of decayed wood and other vegetables, are made into peat for fuel. Some of them are of considerable extent and depth; and those towards the south-east, in the parishes of Selkirk, Robertson, and a corner of Yarrow and Ashkirk, cover large beds of excellent shell-marle. In the rills by which some of them are fed, many small stones are found; some of them over-spread with a glutinous substance, others incruusted with matter very similar to that of which the shells are composed; others again with shells in every progressive state of formation; and a few with the animals alive, in shells completely formed, but of different degrees of consistence and hardness.

To account for this incrustation of stones with calcareous earth, in a county where no lime is known to exist, and to determine whether it comes from some rock as yet unexplored, from loose fragments or particles scattered among other substances, and washed away by streams, or from pulverized shells, or from any other matter found in the neighbourhood, would require a scientific and accurate examination of the surrounding mountains, and the different strata of which they are formed. On the supposition of the incrustation proceeding from a rock, or detached pieces of lime, it may become a question how far this substance is necessary or useful to the animals in rearing their shells, and on the other supposition, of its being occasioned by pulverized shells, it is of equal importance to ascertain the materials from which these shells are constructed.

Agriculture.—The agriculture of such a county as this, cannot be a very interesting subject. In the lower parts of the county, the best practices in agriculture are successfully pursued, as in Roxburghshire and Berwickshire; but in the upper part of the county, or forest, as it is called, where the arable land is not fenced off, and the disadvantages of an unfavourable soil and climate occur, little can be done. In this situation, the small portion of arable land on the skirts of the hills is chiefly cropped with oats, which are the grain best adapted to the nature of the climate, and the wants of its inhabitants, both as a part of their food, and for the support of their horses. In these situations, the principal improvement that can be adopted, consists in rendering the arable land subservient to the support of sheep, which form

the great object of the farmer's attention. Accordingly, green crops, such as turnips and hay, &c. are raised on many of the farms, from which very great advantages are derived, being food to the sheep in storms. Little wheat is produced in the county. Both barley and bear or bigg are sown. The return from barley is, at an average, from seven to eleven-fold. The return from bear is nearly the same, but the weight and market price are greatly inferior. Artificial grasses are very generally sown. Pease are less cultivated than formerly, the preference being given to turnips.

Live Stock.—Sheep are the staple animal of this county, and their number is estimated at 118,200. There are two sorts, *viz.* the original breed, which are black-faced, and the white-faced, which are generally of the Cheviot breed. The former, being about one-third of the whole number, are to be found in the upper or western part of the county, and the latter mostly in the lower districts of the shire. The different qualities and value of these two breeds should seem nearly balanced, for though, of late years, a preference has been given to the Cheviot sheep, on account of their superior fleece, and even the opinion of their being less hardy than the black-faced sheep has been disputed, yet it is admitted that the white-faced lambs, when very young, are much barer in wool, and therefore less protected from the weather, than the black-faced; and in an inclement lambing season, nearly four times more of them die than of the black-faced kind. The mutton of the latter is likewise accounted more delicate. The practice of making ewe-milk cheese is nearly abandoned, from an opinion that it weakens the ewe. The few horses requisite for cultivating the arable district, are of the Lanarkshire and Northumberland breed. Swine are reared only by a few gentlemen for their tables, and by millers for the market. Vast quantities of poultry are raised by the farmers, who send cart-loads of eggs to Berwick, which are bought by "egglers," who sell them again for the London market.

Inclosures.—Inclosures are not very generally used, unless round gentlemen's seats, and on the farms in their own possession. The reader is referred to what is mentioned in the account of Roxburghshire, as to the kind of inclosures used.

Towns, Villages, Roads, Fairs, and Manufactures.—Selkirk is the capital of the county. (See SELKIRK.) Galashiels, so called from its being situated on the banks of the water Gala, is a thriving village. It has been long known for its manufactures of woollen cloth, which was at first coarse, and of a grey colour, and was called "Galashiels's grey;" but the cloths recently manufactured are of various kinds and colours. In consequence of an act of parliament obtained in 1764, a road of twelve miles was made from Crosslee toll-bar, on the confines of Mid-Lothian, through Selkirk, to Harems toll-bar, with a branch of three miles to Galashiels. Part of the road from Kelso to Peebles, of about six or seven miles long, also runs through this county from Galashiels's bridge to Gait-hope burn, beyond Holhise toll-bar. The expence of these roads, and of a substantial bridge over the Tweed, was 6560*l.* There are two considerable fairs held at Selkirk; four lesser fairs are likewise held there, and three at Galashiels for various purposes. The chief manufactures are woollen cloth, stockings, tanned leather, and different implements of husbandry, or wood blocked out for making them.

Antiquities.—There are but few remains in this shire of British or Roman antiquities. There are the remains of some British strengths in the eastern division of the shire, which were erected upon heights, and were constructed generally in a form between the circular and the oval. There is also a Roman camp in the midst of several of these strengths,

in the parish of Robertson. But the most remarkable remains of the Britons in this shire, is the "Catrail," or battle fence, consisting of a large fosse, with a rampart on either side. Its length is 28 miles. This vast war-fence can only be referred, for its construction, to the romanized Britons, who, after the abdication of the Roman government, had this country to defend against the intrusion of the Saxons on the east, during the fifth century, the darkest period of our history. The modern antiquities of Selkirkshire consist chiefly of ruined castles and moss-grown towers, erected, some of them, in the twelfth century, but the greater number of them in subsequent ages of foreign hostilities or domestic feuds.

Historical Events.—Like other counties of Scotland, Selkirkshire has its share of family feuds, fanatical conflicts, wars, and battles, which would occupy too large a portion of our pages to recount. Selkirk became a royal burgh on an occasion that reflects high honour on the loyalty and spirit of this ancient town. When James IV. was marching forward to his fate at Flodden field, a hundred townsmen joined him under the town clerk. They fought stoutly; they almost all fell in the field rather than flee. On the 13th of September 1645, was fought the decisive battle of Philiphaugh. This is one of the last civil conflicts which stained the forests of Selkirkshire with human gore.

Eminent Natives.—This shire puts forth a fair claim to rank in its annals many characters of celebrity. The Douglasses, the Scotts, the Murrays, and Patrick Ruthven, who had learned the art of war under the great Gustavus, and was created lord Etterick, are names conspicuous in history. Andrew Pringle, who was placed in the senate house on the 14th of June 1759, by the title of lord Alemoor, as a lawyer was distinguished by his modesty and eloquence, and as a judge for his dignity and knowledge. It produced an eminent soldier in colonel William Ruffel, of Ashyfted, who distinguished himself amongst the warriors of India. *Mary Scott, the flower of Yarrow*, is still remembered by the "cold-blooded ministers of Etterick forest." She is celebrated by Ramfay in amorous rant:

"With success crown'd, I'll not envy
The folks, who dwell above the sky;
When Mary Scott's become my marrow,
We'll make a paradise on Yarrow."

Population.—This county has seven parishes, and a portion of two others, containing a population of 5889 persons. Selkirkshire, as a county, sends one representative to the united parliament. *Beauties of Scotland*, vol. ii. 8vo. 1805. Chalmers' *Caledonia*, vol. ii. 4to. 1810.

SELL, in *Building*, is of two kinds, *viz.* ground-sell, which denotes the lowest piece of timber in a timber building, and that on which the whole superstructure is raised. See *GROUND-PLATES*.

SELL, *Window*, called also *window-soil*, is the bottom piece in a window-frame.

SELL-Bed, in *Mining*, a term used in some parts of England to express some particularly rich parts of the vein of ore.

In Cornwall they sometimes find the tin-ore so pure, that it requires only bruising to dress it, without the washing and separation by grates, launders, and the like means: they call these collections of ore the sell-beds of tin; and it is observed, that these never have any strings issuing from them, as the other lands have. *Philos. Trans.* N° 60.

SELLA, in *Ancient Geography*, a river of Messenia, N. of the isle of Oenussa.

SELLA, in *Geography*, a town of Africa, in Benguela.

SELLA,

SELLA, among the Romans, a chair in which the old and infirm are carried by servants through the city, and in journeys. Sometimes the physicians prescribed it as an exercise. See **LECTICA**.

SELLA Curulis, among the Romans. See **CURULE chair**.

SELLA Equina, Turcica, or *Sphenoides*, in *Anatomy*, is a name given to the four apophyses of the os sphenoides, or cuneiforme, in the brain; in regard of their forming a resemblance of a saddle, which the Latins call *sella*.

They are sometimes also called by the Greek name *clinoides*. In it is contained the pituitary gland, and in some beasts, the rete mirabile.

SELLARE, in *Geography*, a town of Naples, in Calabria Ultra; 16 miles N.E. of Bova.

SELLASIA, in *Ancient Geography*, a town of Laconia, S.W. of Glympes, on the river Oenus. It was destroyed in the time of Pausanias. When T. Quintius Flaminius passed into the Peloponnesus, 195 years B. C., to deliver Greece from the yoke of the tyrants who oppressed it, he sojourned near this place; but a little after this time, it was destroyed by Aratus, the conqueror of the Lacedæmonians. Towards the N.W. was a mountain, which bore the name of Mount Olympus. The famous battle of Sellasia, in the year 122 B. C., was fought between this mountain and Eva. Antigonus, king of Macedonia, was at the head of the Achæans, and Cleomenes, king of Sparta, commanded the Lacedæmonians. This last, having been entirely defeated, returned into Egypt to king Ptolemy Philadelphus.

SELLAY, in *Geography*, a small island of the Hebrides, in the district of Harris and county of Inverness, Scotland. It is about a mile in circumference, and yields excellent pasture for sheep.

SELLE, a town of France, in the department of the Cantal; 6 miles S. of Aurillac.—Also, a river of France, which runs into the Scheldt, about six miles above Valenciennes.

SELLE-sur-Bied, La, a town of France, in the department of the Loiret; 7 miles N.E. of Montargis.

SELLEE, a town of Hindoostan, in Guzerat; 25 miles S.E. of Mahmoodabad.

SELLEF, a town of Persia, in the province of Irak; 110 miles E. of Ispahan.

SELLEIS, in *Ancient Geography*, a river of the Peloponnesus, in Sicyonia. Strabo places the village Ephyra on the bank of this river.—Also, a river of Ætolia, in Agræa, according to Strabo.—Also, a river of Asia Minor, in the Troade, which watered the town of Arisba, according to Homer, cited by Strabo.

SELLEMPOUR, in *Geography*, a town of Hindoostan, in Oude; 42 miles S.E. of Gooracpour. N. lat. 26° 15'. E. long. 84° 12'.

SELLES, in *Ancient Geography*, a people who, according to Homer, fixed their seat, together with the Perrhæbi, in the environs of Dodona; but he must be understood to mean that they were rather ministers of the temple than a distinct people. Strabo, however, says, that a barbarous people of this denomination inhabited the environs of Dodona.

SELLES-sur-Cher, in *Geography*, a town of France, in the department of the Loire and Cher, and chief place of a canton, in the district of Romorantin; 14 miles S.W. of Romorantin. The place contains 3400, and the canton 6745 inhabitants, on a territory of 325 kilometres, in 9 communes.

SELLI, in *Ancient Geography*, a people of Asia, in the Troade.

SELLI, Σελῶι, in *Antiquity*, an appellation given to those who first delivered oracles. These, according to Strabo

and Eustathius, were men, and the name *selli* is said to come from *Sella*, a town in Epirus, or from the river called by Homer *Selleis*.

SELLIA, in *Geography*, a town of Naples, in Calabria Ultra; 4 miles N.N.E. of St. Severina.

SELLIERA, in *Botany*, a genus dedicated by Cavanilles to a Parisian engraver, *Natalis Sellier*, who executed the plates of the first and second volume of Cavanilles' *Icones*, and also of his *Monadelphica*.—Cavan. Ic. v. 5. 49. De Theis, 427.—Class and order, *Pentandria Monogynia*. Nat. Ord. . . .

Gen. Ch. *Cal.* Perianth superior, permanent, deeply five-cleft. *Cor.* of one petal, irregular; tube cloven longitudinally to the base; limb ascending, cloven into five, lanceolate segments. *Stam.* Filaments five, placed in an erect manner on the germen, surrounding the style; anthers ovate, erect. *Pist.* Germen inferior, ovate, turban-shaped; style simple, incurved, longer than the filaments; stigma globular, truncated. *Peric.* Berry ovate-turbinate, crowned by the calyx, of one cell and many seeds. *Seeds* ovate, compressed, roughish.

Eff. Ch. Calyx superior, five-cleft. Tube cloven longitudinally to its base. Berry of one cell and many seeds.

1. *S. radicans*. Cavan. Ic. v. 5. t. 474. f. 2.—Native of the moist maritime parts of Chili, flowering between February and May.—*Stem* prostrate, hairy, a foot high, sending out fibrous roots. *Branches* scarcely more than an inch long. *Leaves* alternate, spatulate, entire, clustered at the axils. *Flowers* blue and white, either terminating the branches, or axillary, on solitary stalks, which have two awl-shaped bractæas in the middle.—Cavanilles described this elegant little plant from a dried specimen only. He says that it differs from *Scævola* in its fruit, which he suspects to be succulent, as in *Passiflora*; for after immersing the berry in warm water, he found it abounded with little moist cavities containing a glutinous fluid.

SELLIERS, in *Geography*, a town of France, in the department of the Jura; 9 miles W. of Poligny.

SELLIGA, in the *Materia Medica*, a name by which some authors have called the *narda Celta*, or Celtic spike-nard of the shops.

SELLINAGUR, in *Geography*, a town of Hindoostan, in Oude, on the left bank of the Ganges; 60 miles W. of Kairabad.

SELLING of Land, in *Rural Practices*, the business of disposing of or transferring it from one to another for a certain stipulated sum. There are different modes of effecting this, according to Mr. Marshall, as by public biddings, and private contract or agreement, in each of which a proper degree of precaution is requisite. In the former, as the conditions are fixed, an accurate valuation affords the greatest safety; and in the latter, with upright intentions, little more is necessary. In particular cases, however, where a landed estate has fallen into bad hands, more caution may be required, and it may be occasionally necessary to call in the professional aid of those who, from the nature of their employment, are upon their guard against all sorts of trick and cunning. It is suggested as highly improper to make use of the person who is to examine the title and adjust the deed of conveyance, to carry on the business of purchasing an estate;—of whose value and uses he is professionally ignorant; as the irresolution, want of decision, the consequent mistakes, and the necessary delays, that will always attend the negotiations of men who are conscious of a want of knowledge in the subject they are employed to treat on, must ever tend to the disadvantage of their employers. The above writer has known so many instances of

of disadvantage arising from suffering more men of the law to intermeddle in the purchases of lands, before the preliminaries of agreement have been adjusted, that no apology is due to the profession for the observations which he has thrown out in the above cases.

But in purchasing by private contract, the particulars which may be required to be furnished by a seller, are, he says, the quantities of the several pieces of lands on sale, together with the maps, or rough draughts of the same; the tenure under which they are holden; some assurance as to the title of the seller, and his right of alienation; the tenancy under which the several farms are let: and, if on lives, the ages of the nominees; if for a term of years, the number unexpired; if at will, the notices (if any) which the tenants have had: and an abstract of the covenants under which they are let; particularly those which relate to taxes and repairs, to the expenditure of produce, to the ploughing of grass-lands, &c.: the existing rents and profits receivable; whether for tenanted lands, appurtenances, or abstract rights; with the estimated value of the demesne, and the wood-lands, in hand; together with the estimated value of the timber growing upon the estate on sale; as well as of the minerals and fossils which it may contain: the outgoings to which the estate is liable; the proposed time of the delivery of possession; the price and the mode of payment expected for the same. And in the next place, he considers it as proper to set down the particulars of *instructions* to be given to a surveyor, or other valuer, of an estate to be purchased. But it will be right, however, he thinks, to premise, that much, in this respect, depends on the probability of purchasing; and on the time allowed for making the estimate. In cases of sale by public auction, where there can be no certainty as to purchase, and where the time for valuation is limited, a rough estimate of each farm, and a general idea of the value of the timber and other appurtenances, may be all that can be prudently ascertained. While in a sale by private contract, where the refusal of an estate is granted, and time allowed for deliberate survey, a more minute investigation may be proper, especially when there is every reason to believe that a bargain will take place. For the same report will not only serve as a guide to the purchase, but will become a valuable foundation on which to ground the future management of the estate. And he suggests, that for these and other reasons, a purchase by private contract is most to be desired by a gentleman, who is not in the habit of personally attending public sales, and is unacquainted with the business of auction rooms. But, he says, it does not follow that a sale by auction is equally ineligible for a seller; who may gain the advantage ground by this mode of disposal; provided he can frustrate the combinations of public sales. The auction duty, however, and the heavy expences of public sales, are objections to this method of making a bargain; as the money thus expended must necessarily come out of the pocket of the buyer or the seller.

And in regard to the particulars to be required from a surveyor or surveyors, they are principally these. The rental value of each field or parcel of land, with the state in which it lies, as to arable, meadow, pasture, or wood-land. The value of the timber, and other appurtenances. The characteristic, and the state of management, of each farm or tenement; with the eligibility of its occupier; together with the state of repair of buildings, gates, fences, water-courses, and roads; the amount of the incumbrances and outgoings; and, lastly, the probable value of the improvements of which the estate may appear to be capable, in

different ways. And it is also added, that these several particulars of information being procured, the subjects of treaty are few. The two statements having been duly compared, so that no misunderstanding can take place between the parties, the price, with the times and mode of payment, are the principal matters of agreement. A clear understanding respecting the custody of title deeds, and the expences of conveyance, require, however, to be enumerated among the preliminaries of the purchase before any thing is finally settled.

But in what relates to the business of the negotiation, it is best carried on by letters; which become vouchers of facts. Whatever is done by interview requires to be reduced to writing, and to be read by or to the parties before they separate, that no possibility of misconception may arise. And in addition to these precautions, it is proper, in large purchases, and when abstracts of intricate title deeds are to be made out, and examined, that a legal contract, or memorandum of agreement, should be entered into for the mutual satisfaction and surety of the parties. This contract, and the deed of conveyance, (namely, the instrument which is legally to transfer the property from the seller to the purchaser,) may be said to conclude and ratify the business of the purchase, and in this part of it, legal assistance is essentially necessary; to examine existing deeds, and see that the seller has a legal right and clear title to the land, and a legal power to dispose of it; as well as to draw up, or examine, the fresh deed of conveyance, and see that it is sufficient to transfer the property, legally and adequately, to the purchaser of such landed estate or property. See *VALUATION of Land*.

SELLIUM, in *Ancient Geography*, a town of Spain, in Lusitania, S.E. of Callipo and N.E. of Scalabis.

SELMA CREEK, in *Geography*, a river of Kentucky, which runs into the Ohio, N. lat. 38° 54'. W. long. 84° 34'.

SELMAS, a town of Persia, in the province of Adirbeizan or Azerbaijan, situated in the most picturesque, and at the same time, the most flourishing division of the province, lying along the N. and W. border of the lake of Urumea, from Tabruz or Tabris, to the confines of Armenia. The town contains about 2000 inhabitants, principally Nestorian Christians, and is famed for its lofty poplars and delightful gardens; 75 miles W.S.W. of Tabreez. N. lat. 37° 45'. E. long. 45° 20'.

SELNITZ, a town of Bohemia, in the circle of Chrudim; 16 miles N.W. of Chrudim.

SELO, a river of Naples, which runs into the Mediterranean, near Pefti.

SELOCZOW, a town of Austrian Poland, in Galicia; 40 miles E. of Lemberg.

SELOGOORAR, a town of Hindoostan, in Berar; 20 miles N. of Notchegong.

SELOKOI, a town of Russia, in the government of Tobolsk. N. lat. 64° 8'. E. long. 76° 14'.

SELOMMES, a town of France, in the department of the Loire and Cher, and chief place of a canton, in the district of Vendôme; 6 miles S.E. of Vendôme. The place contains 652, and the canton 4396 inhabitants, on a territory of 215 kilometres, in 16 communes.

SELON, a town of Hindoostan, in the Carnatic; 10 miles S.W. of Tiagar.

SELONDA, a small island in the East Indian sea, near the N. coast of Cumbava. S. lat. 8° 5'. E. long. 117° 34'.

SELONGEY, a town of France, in the department of the Côte d'Or, and chief place of a canton, in the district of Dijon; 4 miles N. of Is sur Tille. The place contains

1878, and the canton 5801 inhabitants, on a territory of 200 kilometres, in 11 communes.

SELORICO. See **CELORICO**.

SELOWITZ, a town of Moravia, in the circle of Brunn; 12 miles S. of Brunn.

SELRAIN, a town of Tyrol; 7 miles W.S.W. of Innsbruck.

SELSEA BILL, a cape on the S. coast of England, in the county of Suffex, which takes its name from a village, situated on a peninsula formed by an inlet of the sea, called "Selsea harbour;" 8 miles S. of Chichester. N. lat. 50° 41'. W. long. 0° 50'.

SELSTEN, a town of the duchy of Bremen; 8 miles S.S.E. of Bremervord.

SELTERS, or **NIEDER SELTERS**, a town of Germany, in the archbishopric of Treves, situated on the Emsbach; near which is a celebrated medicinal spring; 21 miles N. of Mentz. See **SELTZER-WATER**.—Also, a village of the principality of Nassau, on the Lahn, with a medicinal spring; 2 miles N. of Weilburg.

SELTSCHAN, or **SEDLÉZANY**, a town of Bohemia, in the circle of Moldau; 22 miles S.E. of Beraun. N. lat. 49° 42'. E. long. 14° 25'.

SELTZ, a river of Germany, which runs into the Rhine, 3 miles N. of Ingelheim.

SELTZ, or *Selz Benheim*, a town of France, in the department of the Lower Rhine, and chief place of a canton, in the district of Willembourg, seated on the Rhine; 22 miles N.N.E. of Strasburg. The place contains 1070, and the canton 10,110 inhabitants, on a territory of 155 kilometres, in 18 communes.

SELTZBACH, a town of France, in the department of the Upper Rhine; 6 miles S.W. of Colmar.

SELTZER-WATER, the name of a mineral water of Germany, which arises near Neider Seltzer, or Lower Seltzer, about ten miles from Francfort on the Mayne, and which is now used in England and many other countries.

This water issues forth at the spring with great rapidity, is remarkably clear and bright, and on pouring it from one bottle into another, discharges abundance of air-bubbles.

That which is imported at London is brought over in stone-bottles, closely corked and cemented, containing about three English pints each, by which means this water, as long as the common air is excluded, will retain many of its excellent qualities for several months; but this caution is so necessary, that if too large an empty space is left even in the neck of a bottle, it soon loses in a great degree the brisk, smart, pungent taste, which principally characterizes its excellence, and is more liable to be injured by keeping than any other mineral water.

Hoffman, in consequence of an analysis of this water, observes, that an immediate effervescence ensues on mixing any acid with it, and especially with Rhenish wine and sugar, in which case the emotion is attended with a noise, and the liquor becomes milky; but mixed with Rhenish wine alone, it becomes turbid, and acquires a brown colour with a reddish cast; that the taste of this water is not so penetrating and subacid as that of most other mineral waters, but has a flavour resembling that of a diluted solution of a lixivial salt: that, with an addition of powder of galls, it does not become purple, nor blacken the stools of those who drink it; that, on adding oil of tartar, it becomes milky without any precipitation: that a quart of this water gently evaporated yields a drachm and twelve grains of a saline matter, which, dissolved and filtrated, yields, on a second evaporation, two scruples of a pure alkaline salt; and that this salt dissolved in water, and added to a solution

of corrosive sublimate, precipitates a yellow powder or turbith mineral, and mixed with an infusion of rhubarb, gives it a reddish colour, and mixed with sal ammoniac, emits a pungent smell: that a quart of this water, saturated with spirit of vitriol, and gently evaporated, affords a drachm and a half of salt, not distinguishable from vitriolated tartar: that no medicinal water is so apt to spoil and be corrupted by keeping, and that if it be set for a day or two in an open vessel, it wholly loses its natural flavour, and tastes only like water in which oil of tartar had been mixed.

From all these observations he infers, that this water abounds with an alkaline salt in a much greater quantity than any of the other known mineral waters, without seeming to contain any particles of the ferruginous earth and bitter purging salt, which are the common ingredients of the other mineral waters: on this account, he adds, that it does not purge, but generally goes off by urine. Hoffman recommends it as one of the mildest and most innocent of all the mineral waters, and observes that it may be taken by persons of the weakest constitution.

From the experiments of Dr. Brocklesby on Seltzer-water, we learn, that upon dropping twelve drops of very highly coloured syrup of violets into a wine-glass of it, the syrup seemed first to manifest a purple hue, but upon their intimate union, the whole changed into a beautiful green: that the same quantity of oil of tartar per deliquium dropped into a glass of sparkling, fresh, clear water, quickly turned the whole milky, and after standing, a fine pearl-coloured powder fell to the sides and bottom of the glass; on adding an equal number of drops of pure dephlegmated spirit of vitriol to a glass of this water, a light cloud was seen suspended towards the middle of the glass, and numerous air-bubbles rose from all parts of the water, and the sparkling might be renewed by adding one or more drops of the acid, and shaking the glass; and the like ebullition was more readily produced by a solution of fugar and Rhenish wine, or vinegar with the same: and the same appearances were exhibited by dropping any vegetable or mineral acids into this water, as are observed when alkalies and acids are mixed together: a volatile caustic alkali, in half an hour after it had been dropped into this water, produced at first a cloud and afterwards a precipitation. Lixivium saponarium so far decomposed a glass of Seltzer-water, that a cloud instantly appeared in the middle of it, and the air-bubbles emerging from the lower part of it were greedily absorbed by the caustic alkali, which is known to imbibe fixed air, whenever it comes into contact with it. This water, says Dr. Brocklesby, poured into a glass, separates more air-bubbles than any other water which he had tried, and continues longer to do so in the open air, but its sparkling may be renewed by adding any sub-acid vegetable, and a little fugar, as sharp cyder and Rhenish wine and sugar; but, he adds, that the best Seltzer-water here will not perfectly curdle milk, nor lather with soap, and that with powder of gall-nuts no farther change of colour appeared than in pure water. By evaporating twenty-four ounces of the best Seltzer-water, he obtained thirty-six grains of a saline residuum; and the greatest quantity he could ever get from a pint, wine measure, was less than thirty grains.

Ten drops of strong spirits of vitriol, poured on as many grains of salt of Seltzer-water, caused great and instant ebullition, and suffocating steam, which tinged blackish a silver spoon held in them, and gave to its polished surface a bitter taste.

Having dissolved sixty-six grains of pure white salt, obtained

tained from this water, in distilled water, and filtrated it, he thereby obtained seven grains of a calcareous earth, perfectly soluble in all weak acids; but by several different modes of trial he was led to conclude, that this water contains no ferruginous principle.

Finding that the salts and earths contained in Seltzer-water are too inconsiderable, both in quantity and quality, to promise any very material medicinal effects, he proceeded to investigate what might be ascribed to the great quantity of fixed air, which this water constantly discharges, in a heat not exceeding that of the human body; and the result was, that the facitious air yielded by a bottle full of water, containing exactly fourteen ounces seven drachms, in a heat never exceeding 116° by Fahrenheit's scale, amounted to a quantity which occupied a space, that required two ounces two and a half drachms of water to fill it; or allowing two hundred and sixty-five grains of common water for a cubic inch, the whole water amounted to twenty-seven cubic inches, and that which would fill the space occupied by the air four ounces and one-fifth; and so large a quantity of interstitial air, he says, was generated in a heat not incompatible with life in any part of the world, as the fever-heats in all climates testify, and less than the heat which is often experienced without instantaneous prejudice, in some tropical climates.

However, this generated air soon began to be re-absorbed into the body of the water, and in about eight hours, the space occupied by the remaining air did not exceed one-fifth of what it had formerly done.

From another experiment with the salt of Seltzer-water, he found that this seems to have let go much the greatest part of its fixed air, and probably thereby lost most of the virtues inherent in the pure fresh water itself.

From such experiments Dr. Brocklesby infers, that Seltzer mineral water contains, besides the mere elementary water, a very small quantity of calcareous earth, and a much greater portion of a native mineral alkali, together with some acid retained a while within the water, but which either evaporates into the open air, or else is soon combined with the mineral alkali: and he thinks it probable, that the active virtues of this water depend more on this elastic matter, or fixed air, which it contains in such uncommon abundance beyond other mineral waters, than in any combination of its saline and earthy contents, which are found in such small quantities, as to be incapable of any material service, though this water is known to be exceedingly beneficial.

This account of the analysis of Seltzer-water is closed with the history of some medical cases, in which the use of this water completed a cure, after a great variety of other remedies had proved insufficient.

The operation of this water, as Hoffman observes, is chiefly by urine, for it has no purgative virtues. It corrects acidities, renders the blood and juices more fluid, and promotes a brisk and free circulation; and, therefore, it is good in obstructions of the glands, and against gross and viscid humours. It is of great use in the gravel and stone, and other disorders of the kidneys and bladder.

It is also excellent in gouty and rheumatic complaints, especially when mixed with milk, or improved by the addition of Rhenish wine and a little sugar. It is drank with great success in scorbutic, cutaneous, and putrid disorders. It relieves the heart-burn, and is an excellent stomachic. On account of its diuretic quality, it is serviceable in dropsical complaints: and mixed with asses' milk, it is much recommended in consumptive cases, and in disorders of the lungs; with or without milk, it is in great esteem in nervous

disorders, and also in hypochondriacal and hysterical complaints, and in obstructions of the menses, accompanying the use of it with proper exercise.

It is also administered with success in purging and fluxes arising from acidity in the bowels; and it is said, if drank by nurses, to render their milk more wholesome and nourishing, and to prevent it from turning sour on the stomachs of children. See on the subject of this article Hoffman, Oper. vol. v. p. 144. London Med. Observ. vol. iv. p. 7, &c. Elliot's Account of the Principal Mineral Waters, p. 194, &c.

SELTZER-Water, Artificial, may be prepared by adding one scruple of magnesia alba, six scruples of fossil alkali, and four scruples of common salt to each gallon of water, and saturating the water with fixed air, in the manner directed under *PYRMONT-Water*.

SELVA, in *Geography*, a town of Spain, in Catalonia, on the coast of the Mediterranean, 35 miles N.E. of Gerona. N. lat. $42^{\circ} 20'$. E. long. $3^{\circ} 2'$.

SELVA, a small island in the gulf of Venice, separated from Ulbo by a narrow channel; it is rocky, and the soil so poor, that the olives seldom come to perfection: the vines produce bad grapes, and the corn is still worse. The stone that abounds here is chiefly hard whitish marble. N. lat. $44^{\circ} 38'$. E. long. $14^{\circ} 5'$.

SELVAGE, in *Sea Language*, a sort of hank or skein of rope-yarn tied together at several distances. It is used to fasten round any rope, as a shroud or stay, so that a tackle may be hooked in it, to extend the said shroud or stay, which is called *setting it up*.

SELUCHUSA, in *Ancient Geography*, an island near the Peloponnesus, being one of those which were situated on the coast of the promontory of Spiraëum. Pliny.

SELUCIA, in *Geography*, a town of the Arabian Irak, 160 miles N.W. of Bassora.

SELVE, LA, a town of France, in the department of the Aveyron, and chief place of a canton, in the district of Rodes or Rhodéz; 14 miles S. of Rhodéz. The place contains 840, and the canton 6738 inhabitants, on a territory of $242\frac{1}{2}$ kilometres, in 15 communes.

SELVIG, a town of Denmark, on the W. coast of the island of Samsoe. N. lat. $55^{\circ} 52'$. E. long. $10^{\circ} 36'$.

SELUNE, a river of France, which runs into the sea, near mount St. Michel.

SELUR, in *Ancient Geography*, a town of India, on this side of the Ganges, in the interior of the country of the Caræans, according to Ptolemy.

SELYMBRIA, SELYVRA, called also by Suidas *Olybria*, a town of Thrace, on the coast of the Propontide, between the mouth of the river Athyras and Perinthus, or Heraclea. Its name signifies the town of Selys, *bria* signifying town in the language of the Thracians. See *SELIVRA*.

SELZBACH, in *Geography*, a river of France, which runs into the Rhine, 7 miles below Fort Vauban.

SEM, a river of Russia, which rises in the E. part of the government of Kursk, and passing by Kursk, unites with the Dema, near Sornitza, in the government of Novgorod Sieverskoe.

SEMAMPLEXICAULE LEAF, in *Botany*. See *LEAF*.

SEMANA, in *Geography*, a town of Hindoostan, in the subah of Delhi; 35 miles S. of Sirhind. N. lat. $29^{\circ} 23'$. E. long. $75^{\circ} 33'$.—Also, a town of Japan, in the island of Nippon; 125 miles W. of Meaco.

SEMAO, an island of the East Indian sea, about 24 miles long from N. to S., and from six to ten broad; separated

rated from the S.W. end of the island of Timor by a narrow channel, called the "Straits of Semao." S. lat. $10^{\circ} 15'$. E. long. $123^{\circ} 45'$.

SEMAR, a river which rises in mount Cenis, and after forming a boundary by its course between Savoy and Piedmont, falls into the Doria at Susa.

SEMARILLARIA, in *Botany*, a term applied to seeds which are surrounded half way down by an *arillus*, or any other similar covering.

SEMATAI, in *Geography*, a town of China, of the third rank, in Pe-tche-li; 35 miles N.E. of Pekin.

SEMAU, an island in the East Indian sea; 9 miles S. from the island of Timor.

SEMAUE, or SEMAUAT, a town of the Arabian Irak, on the Euphrates, where a toll is collected; 115 miles S.E. of Bagdad.

SEMBEKE, an island in the Red sea, near the coast of Arabia. N. lat. $25^{\circ} 12'$.

SEMBELLA, among the *Romans*, a small silver coin, equal in value and weight to half the libella.

SEMBEWGHEWN, in *Geography*, a town of the Birman empire, on the Irawaddy; 30 miles S. of Pagham Mew.

SEMBIANI, SEMBIANS, in *Ecclesiastical History*, a sect of ancient heretics, denominated from their leader, Sembius, or Sembianus, who condemned all use of wine, as evil of itself; persuaded his followers, that the wine was a production of Satan and the earth, denied the resurrection of the dead, and rejected most of the books of the Old Testament. Jovet.

SEMBRACENA, in *Ancient Geography*, a town of Arabia Felix, near the sea, in the kingdom of the Sabæans, according to Ptolemy.

SEMRADOR, an engine, invented by Don Jos. de Lucatello, for the evenly sowing of seeds, described in the Philosophical Transactions under the title of the *Spanish Sembrador*.

The perfection of agriculture is allowed to consist much in setting plants at proportional distances, and giving sufficient depth to the roots, that they may spread, and receive their necessary nourishment; yet there is very little care taken in the practice of this important part of husbandry, but all sorts of grains are sown by handfuls cast at random, by which means four parts in five of the seed are lost. To remedy this inconvenience, the sembrador, or sower, is invented, which being fastened to the plough, the whole business of ploughing, sowing, and harrowing, is done at once; the seedman's trouble is saved, and the grain spread at equal distances, and equally deep at the bottom of the furrow.

An experiment to this purpose was made before the emperor Leopold in the fields of Luxemburgh in Austria, where the land usually yields four or five-fold; but the crop from the ground sowed by this instrument was sixty-fold, as appears by a certificate of the emperor's officer appointed to see the experiment; signed, Vienna, Aug. 1, 1663.

We have a figure of the sembrador, in the Transactions, N° 60. by the earl of Castlemain. See PLOUGH.

SEMACHON, or SIMACHON, in *Ancient Geography*, a lake of Palestine.

SEME, or SEEME. See SEAM.

SEMECARPUS, in *Botany*, derived from *σημειον*, to mark, and *καρπος*, a fruit; a name evidently derived from the use that is made of its nut, in the East Indies, to mark table linen and articles of apparel. If these are put over the nut, and pricked, the juice exuding will make an indelible

stain, which serves as an excellent natural marking ink.—Linn. Suppl. 25. Schreb. 196. Willd. Sp. Pl. v. 1. 1476. Mart. Mill. Dict. v. 4. (*Anacardium*; Juss. Gen. 368. Lamarck Illustr. t. 208. Gærtn. t. 40.)—Class and order, *Pentandria Trigynia*. Nat. Ord. *Terebintaceæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, bell-shaped, cloven half way down into five, heart-shaped, acute segments. *Cor.* Petals five, lanceolate, bordered, obtuse, larger than the segments of the calyx. *Stam.* Filaments five, awl-shaped, shorter than the corolla, inserted into the receptacle; anthers oblong, small. *Pist.* Germen superior, globular, flattened; styles three, recurved, situated on the germen and shorter than it; stigmas club-shaped, retuse. *Peric.* none, except the receptacle, which is erect, fleshy, pear-shaped, smooth. *Seed*, a nut resting upon the receptacle, heart-shaped, flattened on both sides, smooth and shining.

Obs. Dr. Roxburgh has observed some trees of *Semecarpus* with male flowers only, on which account professor Martyn has described the genus as belonging to the class and order of *Polygamia Dioecia*.

Ess. Ch. Calyx five-cleft, inferior. Petals five. Nut somewhat kidney-shaped, standing on a large, fleshy, flattened receptacle.

1. *S. Anacardium*. Marking-nut tree. Linn. Suppl. 182. Roxb. Coromandel. v. 1. 13. t. 12.—Native of mountainous, dry woods throughout the East Indies, flowering in July and August, but ripening its seed in January and February. A handsome lofty tree, whose bark is rough, ash-coloured and glutinous withinside. Branches numerous, spreading, rather hairy. Leaves alternate, on shortish stalks, wedge-shaped, rounded at the tip, entire, firm, nearly smooth above, whitish and a little rough beneath. Flowers in large, terminal, erect panicles, composed of numerous, small spikes, of a dirty-greenish-yellow colour. Bractles numerous, small, deciduous. Receptacle yellow, as large as the nut, which is black, containing a corrosive resinous juice, at first of a pale milk colour, but turning black.

The wood of this tree is soft, containing an acrid juice. The fleshy receptacles when roasted have the flavour of apples, and are eaten by the natives. The green fruit, pounded into a pulp, makes good bird-lime; when ripe, its black acrid juice is highly esteemed by the Telinga physicians, as a remedy for various disorders.

SEMEGONDA, in *Geography*, a town of Africa, in the kingdom of Wangara, on the Niger, near a lake called by Ptolemy Libya Palus. N. lat. $15^{\circ} 22'$. E. long. $22^{\circ} 30'$.

SEMEIOTICA, *σημειωτική*, formed from *σημειον*, sign, or symptom, that part of medicine which considers the signs or appearances of diseases, which are the sole guides to the physician, by which he can ascertain the seat and nature of diseases, and their probable termination. It includes, therefore, the art of *diagnosis* and *prognosis*, and *nosology*, or the art of arranging diseases in methodical order. See these words respectively.

SEMELA, in *Geography*, a town of Africa, in Tripoli; 145 miles S. of Melurada.

SEMELE, in *Mythology*, the mother of Bacchus.

SEMELITANI, in *Ancient Geography*, a people who inhabited the interior of Sicily, according to Pliny.

SEMEN, in *Botany*. See SEED.

SEMEN, in *Physiology*, an animal fluid secreted by the male, the contact of which is necessary to render the germs formed by the female prolific. See GENERATION.

SEMEN *Sanctum*, or *Santonicum*. See WORM-SEED.

SEMENCAN, in *Geography*, a town of Grand Bucharia; 100 miles S.E. of Balk.

SEMENDERY, a town on the S. coast of the island of Java. S. lat. $7^{\circ} 1'$. E. long. $106^{\circ} 50'$.

SEMENDRIA, a town and fortrefs of Servia, on the S. side of the Danube; 20 miles S.E. of Belgrade. N. lat. $44^{\circ} 52'$. E. long. $20^{\circ} 41'$.

SEMENG, in *Musick*, an instrument used in Arabia by those wandering musicians who accompany the dancing women. It is a sort of bad violin, joined with a drum. The body is commonly a cocoa-nut shell, with a piece of skin extended upon it; three strings of catgut, and sometimes of horsehair, are fitted to it; and it is played with a bow, not less awkward in its form than the Greek lyre.

SEMENGIAN, in *Geography*, a town of Persia, in the province of Segestan; 132 miles S. of Kin.

SEMENJAN, a town of Grand Bucharia; 70 miles W. of Anderab. N. lat. $36^{\circ} 22'$. E. long. $66^{\circ} 50'$.

SEMENNUD, a town of Egypt, on the E. branch of the Nile; 8 miles S.S.W. of Mansora.

SEMENTOV, a town of Russia, in the government of Niznei-Novgorod; 36 miles N. of Niznei-Novgorod. N. lat. $55^{\circ} 30'$. E. long. $44^{\circ} 14'$.

SEMENTOVSKOI, a town of Russia, in the government of Vologda; 44 miles N.N.W. of Vologda.

SEMENTINÆ FERIÆ, in *Antiquity*, feasts held annually among the Romans, to obtain of the gods a plentiful harvest.

They were celebrated in the temple of Tellus, or the Earth, where solemn sacrifices were offered to Tellus and Ceres.

The time of the celebration was about seed-time, usually in the month of January; for Macrobius observes, they were moveable feasts. They had their name from *semen*, seed.

SEMERON, in *Ancient Geography*, a royal town of Judæa, in the tribe of Zebulon, according to the book of Joshua, whither, it is said, Jabin sent a messenger to demand succour of the king of the city, and which he accordingly obtained, together with that of several other kings, to attack the Israelites; but they were all defeated and slain in the combat.—Also, a mountain of Judæa, in the tribe of Ephraim, E. of Sichem; called also the mountain of Samaria.

SEMETS, **SUMMETS**, or *Summits*, in *Botany*, are used by Dr. Grew and others, for the apices of the attire of plants.

SEMI, a word borrowed from the Latin, signifying *half*; but only used in composition with other words, as in the following articles.

The French, instead of *femi*, frequently use *demi*, the Greeks *hemi*.

In music, *femi* has three several usages; first, when prefixed to the name of a note, it expresses a diminution of half its value, as in *femi-breve*, &c.

Secondly, when added to the name of an interval, it expresses a diminution, not of half, but of a lesser semi-tone, or four commas, in the whole compass, as in *femi-diapente*, &c.

Thirdly, in old music to the end of the 16th century, it implies imperfection in the value of notes, as a semi-circle, or *circolo mezzo*; the whole circle then implying perfection, or triple-time. O three breves, or three times three femi-breves, without a point. **C** common time, or, as it was then called, imperfect, or dual measure. See *Musical CHARACTERS*, and the first *TIME-Table*.

SEMI-ARIANS, in *Ecclesiastical History*, a branch of the ancient Arians, consisting, according to Epiphanius, of

such as, in appearance, condemned the errors of that heresiarch, but yet acquiesced in some of his principles, only palliating and hiding them under softer and more moderate terms. See **ARIANS**.

It is true, they separated from the Arian faction; but yet could never be brought to acknowledge that the Son was homouousios, that is, consubstantial, or of the same substance with the Father; they would only allow him to be homoiousios, that is, of a like substance with the Father, or similar to the Father in his essence, not by nature, but by a peculiar privilege. See **HOMOIOUSIOS**, &c.


Though, as to expression, they only differed from the orthodox by a single letter, yet were they, in effect, of the opinion of the Arians, as they placed the Son in the rank of creatures. It did not avail their teaching, that there was no other creature of the same class with him, since by denying him consubstantial with God, they effectually precluded him from being truly God.

Yet some, even among the orthodox, use the word homouousios, in speaking of the Son; applying such an idea to it as it seems is consistent with orthodoxy.

But the name Semi-Arians is also given, by the second general council, to another branch of Arians, who believed orthodoxly of the Father and Son, but denied the deity of the Holy Ghost; thus rejecting that part of the Arian system relating to the Son, but still retaining that which related to the Holy Ghost.

As the zeal of the Arians was chiefly levelled against the second person in the Trinity, that of the Semi-Arians was bent against the third; whence, as the former were sometimes called *Χρεισμομαχοι*, the latter were denominated *Πνευματομαχοι*.

Macedonius, bishop of Constantinople, made an innovation in this sect in 360, and gave rise to a new branch of Macedonian Semi-Arians, or Pneumatomachi; who allowed the Son not to be *ομοουσιος*, of the same substance, but *ομοιος*, of like substance with the Father; and at the same time openly asserted the Holy Ghost to be a creature. This heresy was condemned by the eleventh general council held at Constantinople in the year 381. See **MACEDONIANS**.

SEMIBREVE, $\circ - \ominus$, half a breve , in *Musick*.

See the *TIME-Tables*.

SEMICIRCLE, in *Geometry*, a figure comprehended between the diameter of a circle, and half the circumference.

Two semicircles can only cut each other in one point.

SEMICIRCLE is also an instrument in *Surveying*, sometimes called the *graphometer*.

It consists of a semicircular limb, as F, I, G, (*Plate VII. Surveying, fig. 3.*) divided into one hundred and eighty degrees, and sometimes subdivided diagonally or otherwise into minutes. This limb is subtended by a diameter F G, at the extremities of which are erected two sights. In the centre of the semicircle, or the middle of the diameter, is fixed a box and needle. On the same centre is fitted an alidade, or moveable index, carrying two other sights, as H, I. And the whole is mounted on a staff, with a ball and socket.

The semicircle, then, is nothing else but half a theodolite; with this only difference, that whereas the limb of the theodolite, being an entire circle, takes in all the 360° successively; in the semicircle the degrees only going from 1° to 180° , it is usual to have the remaining 180° , or those from 180° to 360° , graduated in another line on the limb within the former.

To take an Angle with a Semicircle. Place the instrument in such manner, as that the radius C G may hang over one

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leg of the angle to be measured, and the centre C over the vertex of the same. The first is done, by looking through the sights F and G at the extremities of the diameter to a mark fixed up in one extremity of the leg; the latter is had by letting fall a plummet from the centre of the instrument. This done, turn the moveable index H I on its centre towards the other leg of the angle, till through the sights fixed in it, you see a mark in the extremity of the leg. Then the degree, which the index cuts on the limb, is the quantity of the angle.

For farther uses of the semicircle, they are the same with those of the *theodolite*.

SEMICIRCULAR ARCHES. See ARCH.

SEMICIRCULAR Canals, in *Anatomy*, three small membranous tubes, inclosed in excavations of the bone, and composing part of the labyrinth of the ear. See EAR.

SEMICIRCULARIS TÆNIA, a part of the brain. See BRAIN.

SEMICIRCULARIS Palpebrarum Musculus, a name given by Spigelius, and some others, to one of the muscles of the face, called by Albinus and Winslow the *musculus orbicularis palpebrarum*.

SEMICOLON, in *Grammar*, one of the points or stops, used to distinguish the several members of a sentence from each other.

The mark or character of the semicolon is (;). It has its name, as having somewhat less effect than a colon, or as demanding a shorter pause.

The use of the semicolon, the grammarians generally say, is to mark a sense less complete than the colon, and more complete than the comma; but this only conveys a very obscure idea. In effect, the precise office of the semicolon, or that office which distinguishes it from the colon, is a thing very little known to the world. Our best authors seem to use them promiscuously. See COLON.

Dr. Ward, formerly professor at Gresham, is perhaps the first who settled a just use of the semicolon. His position is, that the semicolon is properly used to distinguish the conjunct members of sentences. Now by a conjunct member of a sentence, he means, such an one as contains at least two simple members.

Whenever, then, a sentence can be divided into several members of the same degree, which are again divisible into other simple members, the former are to be separated by a semicolon.

E. gr. If Fortune bear a great sway over him, who has nicely stated and concerted every circumstance of an affair; we must not commit every thing, without reserve, to Fortune, lest she should have too great a hold on us.

But though the proper use of the semicolon be to distinguish conjunct members, it is not necessary that all the members divided by it be conjunct. For upon dividing a sentence into great and equal parts, if one of them be conjunct, all those other parts of the same degree are to be distinguished by a semicolon. Thus, whoever is overtaken with poverty; the same will find, that coldness, contempt, injuries, &c. are not far behind. Hither likewise may be referred such sentences, where the whole going before, the parts follow: as, the parts of rhetoric are four; invention, disposition, elocution, and pronunciation.

According to bishop Lowth, a member of a sentence, whether simple or compounded, that requires a greater pause than a comma, yet does not of itself make a complete sentence, but is followed by something closely depending on it, may be distinguished by a semicolon. *E. gr.* But as this passion for admiration, when it works according to reason, improves the beautiful part of our species in every thing that

is laudable; so nothing is more destructive to them, when it is governed by vanity and folly. Here the whole sentence is divided into two parts by the semicolon; each of which parts is a compounded member, divided into its simple members by the *comma*; which see.

SEMICON, a musical instrument among the Greeks, which had thirty-five strings.

SEMICROMA, *Sextuple of*. See SEXTUPLE.

SEMI-CUBICAL PARABOLA, a curve of the second order, in which the cubes of the ordinates are as the squares of the abscissas. Its equation is $ax^2 = y^3$.

SEMICUPIUM, a half bath, in which the patient is only placed up to the navel. See INSESSUS.

SEMI-DIAMETER, a right line drawn from the centre of a circle or sphere, to its circumference; the same with what we otherwise call a *radius*.

The distances, diameters, &c. of the heavenly bodies, are usually estimated by astronomers in semidiameters of the earth.

For the proportions and values of the semidiameters of the planets, see PLANETS. For their apparent semidiameters, see DIAMETER.

SEMI-DIAPASON, in *Musick*, a defective octave; or an octave diminished by a lesser semitone, or four commas. See DIAPASON.

SEMI-DIAPENTE, a defective fifth, called usually by the Italians *falsa quinta*, and by us a *false fifth*.

SEMI-DIATESSARON, a defective fourth, called, properly, a *false fourth*.

SEMI-DITONE, *DIAPASON*. See DIAPASON.

SEMI-DITONE, *Dis-diapason*. See DIS-DIAPASON.

SEMI-DITONUS, is used by some writers, as Salinas, for the third minor.

SEMI-DOUBLE, in the *Romish Breviary*, a term applied to such offices and festivals as are celebrated with less solemnity than the double ones; but yet with more than the single ones.

The semi-double office has double vespers, and nine lessons at matins; but the anthems are not redoubled. It is performed on Sundays, on the octaves, and on the feasts marked for semi-double in the calendar.

SEMI-FLOSCULOUS, a term used to express the flowers of a certain class of plants, of which the dandelion, hawkweed, and the like, are kinds.

This sort of flower consists of a number of semiflosculi, which are disposed into one or more circles, and all comprehended in the same cup, which often becomes inverted as the flower ripens. These semifloscules are petals, hollow in their lower part, but in their upper half are flat, and continued in the shape of a tongue. These are often separated from each other by intermediate leaves, and are placed upon the embryo fruit, from which there stands out a slender capillament, divided at the end into two parts; often carried beyond the vagina, supported by five props. The embryos are placed in the thalamus, or bottom of the cup, and finally become seeds, sometimes winged with down, sometimes naked, sometimes coronated, and sometimes foliated.

SEMIGALLIA, *Duchy of*, in *Geography*, a division of Courland, about 110 miles in length, and from 10 to 25 in breadth, bounded on the north by Russia, from which it is separated by the Dwina, and elsewhere by Courland. It is subject to Russia. Its capital is Mittaw.

SEMIGERMANÆ GENTES, in *Ancient Geography*, the name of a people who inhabited the Pennine Alps, according to Ptolemy.

SEMIJA, in *Geography*, one of the Fox islands, in the North Pacific ocean. N. lat. $53^{\circ} 5'$. E. long. $175^{\circ} 14'$.

SEMI-INTEROSSEUS INDICIS, in *Anatomy*, a small, short, flat, fleshy muscle, very like the antithenar, or internal semi-interosseus of the thumb. It is situated obliquely on one side of that of the thumb, between the first phalanx of it and the first metacarpal bone. It is fixed by one end to the outside of the basis of the first phalanx of the thumb, and a little to that bone of the carpus, by which this phalanx is supported; and by the other end it is fixed near the head of the first phalanx of the index, on that side next the thumb. It lies almost parallel to the antithenar, crossing it a little; this muscle lying on the convex side of the hand, and the antithenar on the concave. Winslow.

SEMI-JUDAIZERS, in *Ecclesiastical History*, a sect of Socinians, consisting of the disciples and friends of Francis Davides, superintendant of the Socinian churches in Transylvania; who, in consequence of his adherence to the opinions he had adopted, was thrown into prison by Christopher Bathori, prince of Transylvania, where he died, in the year 1579, in an advanced age. The most eminent of his followers were Jacob Palæologus, of the isle of Chio, who was burnt at Rome in the year 1585; Christian Francken, who had disputed in person with Socinus; and John Somer, who was master of the academy of Clausen-burg. The followers of Davides were called Semi-Judaizers by the Socinian writers, according to Mosheim, by way of reproach; but others maintain, that it was grounded on their sentiments, and that it was designed to express the partial preference they gave to the Law of Moses above the Gospel of Christ. The words of Christ, as Davides asserts, and those of his apostles, are to be tried by the doctrine of Moses and the prophets, which ought to be to us the sole rule of life and religious worship. He also maintains, that there is no difference between the old covenant established by Moses, and the new confirmed by Christ, in doctrine or in promises; and that they differ merely in this circumstance, that under the former there was the ministry of the letter, and under the latter that of the spirit; and, therefore, the one has not abrogated or changed the other: so far from it, that the new covenant existed only till the destruction of Jerusalem, and will have no farther influence till the time of Christ's worldly government over Israel in the city of Jerusalem, which is to be rebuilt. In the mean time, Christ is not really the Christ or king of God's people, but only by designation; the Christ predicted by the prophet, and promised by God, having no other than an earthly kingdom, which Jesus was appointed to take possession of; but being slain by the Jews, contrary to the divine purpose, he was translated into a secure and quiescent state. In this state he is not any more to be called God, as he was by virtue of his office during his abode on earth, because his office hath ceased; nor is he entitled to any adoration and worship, as Socinus thought, nor to any other kind of reverence, except obedience to his precepts, and faith in his doctrine; nor is he employed under the distinguishing appellation of priest and intercessor, both which offices terminated at his death. See the propositions drawn up by Faustus Socinus, and presented to C. Bathori, in Socin. Op. tom. ii. p. 801—803, or Toulmin's Life of Socinus, p. 453, &c.

SEMIL, in *Geography*, a river of Cabulistan, which joins the Dilen at Kerdiz, to form the Cow.

SEMILUNAR, SEMILUNARIS, in *Anatomy*, an epithet applied, in consequence of their figure, to various parts of the body.

SEMILUNAR Cartilages of the Knee-joint, are two small portions of cartilage situated in that articulation. See EXTREMITIES.

SEMILUNAR Portion or Edge of the Fascia Lata. See FASCIA.

SEMILUNAR Valves of the Aorta and pulmonary Artery, the three valves placed at the entrance of each of these vessels. See HEART.

SEMILUNARES COCHLEÆ, in *Natural History*, the name of a genus of sea-snails, so called, from their having semicircular mouths. See CONCHOLOGY.

The characters of the genus are these. They are univalve shells of a compact body, with a flat semicircular, and often dentated mouth; the columella, or inner lip, running diametrically across it in a straight line. Some of the species have exerted apices, and some depressed; these are nearly globose shells, and the turban is never much produced, but lies flat or level with the bottom.

There are many distinctive and specific characters in the several species of this genus, which arrange together considerable numbers of the species under each. Thus the neritæ, which are of this genus, are some of them umbilicated, and others have teeth and a kind of gums. The snail kinds, distinctly so called, that fall under this genus, are very different from the neritæ, in that they have no teeth, no gum, and no palate. The term *semilunares cochleæ* was invented by Rumphius to express their mouths, being of the shape of half a circle.

The neritæ generally inhabit caverns in the sides of rocks, and usually stick fast to the stone. Bonani, Recreat. Ment. et Ocul. p. 56. Aldrovand. de Testac. lib. iii. cap. 8. Plin. lib. ix. cap. 33.

All the species of the semilunar shells have few convolutions, and have the extremity of the voluta small, and usually standing a little out.

The species of the semilunar cochleæ are these, as arranged under the two general divisions of dentated neritæ, and umbilicated cochleæ; viz. the dentated nerita, commonly called the gum-shell; the bloody-tooth nerita; the ox-palate nerita; the striated and punctuated nerita; the canaliculated, the furrowed, the thrush, and the partridge nerita.

Of the neritæ which have no teeth, we have ten species; viz. the jasper with a long beak; the jasper with an operculum; the lemon-coloured pea; the yellow pea; the prickly; the reticulated; that variegated with black spots; the red and white fasciated; the lightly striated green; and the undulated nerita.

Of the umbilicated snails we have nine species; viz. the long umbilicated; that with an exerted apex; that with a depressed apex; testiculated; the hermit; the umbonated; the small nipple; the heavy white; and the orange-coloured cochlea. Hist. Natural. Éclairc. part ii. p. 256.

SEMILUNARIS Linea, in the abdomen, is the line following the outer edge of the rectus abdominis muscle. See OBLIQUUS.

SEMI-MEMBRANOSUS, (ischio-sous-tibien; demi-aponévrotique); a muscle of the thigh, situated on the posterior part of the limb, elongated, and extending from the tuberosity of the ischium to the upper and back edge of the tibia. It commences from the tuberosity of the ischium, in front of the biceps and semitendinosus, and behind the quadratus femoris, by a strong flat tendon, which soon expands into a broad aponeurosis, thicker at its external than at its inner edge, and giving origin successively by the latter to the muscular fibres. The latter are all parallel, short, and placed obliquely, and form a thick

a thick mass, which is largest at its middle, and smaller at the two ends. They descend obliquely inwards, and terminate in an aponeurosis, which, beginning opposite to the end of the superior one, receives the fibres successively, and ends below in a thick tendon, which passes behind the knee-joint, and divides into three portions. The external is narrow and slender, ascends obliquely outwards behind the joint, and is fixed above the external condyle of the thigh, confounded with the external head of the gastrocnemius. The middle, which is broad and continuous with the preceding, is fixed to the back of the internal tubercle of the tibia, and sends an expansion over the popliteus. The internal, more considerable and rounded, seems to be the continuation of the tendon; it turns round the tuberosity, and is attached in front of it, contained in a fibrous sheath, lined by a synovial membrane, which must be opened to gain a clear view of it.

It is covered by the semitendinosus, the biceps, and the fascia lata; it lies on the quadratus, the adductor magnus, the popliteal artery, the knee-joint, and the inner head of the gastrocnemius, between which and its tendon there is a synovial membrane.

It bends the leg on the thigh, or the thigh on the leg; and it extends the thigh on the pelvis, or carries the pelvis backwards on the thigh.

SEMI-METALS, a term formerly applied in *Chemistry*, to those metals not possessing ductility or malleability; these properties being then considered as the principal characters of a metal. In a mechanical point of view this is doubtless the case, but the chemical properties of this numerous class of bodies are so striking, as to render the above distinction obsolete. See **METALS**.

SEMINA, in *Ancient Geography*, a town of Asia, in Parthia. Ptolemy.

SEMINAGUR, in *Geography*, a town of Hindoostan, in Oude; 36 miles N. of Kairabad.

SEMINAL, **SEMINALIS**, in *Medicine*, spermatic, or something belonging to the semen or seed.

SEMINAL Leaves, those soft, plain, and undivided leaves, that first shoot forth from the greatest part of all sown seeds, and are different from those of the succeeding plant in figure, texture, and all other respects. See **SEED** and **VEGETATION**.

SEMINAL Varieties of Plants, such as are produced from seeds, which, in many instances, is invariably the case, as in the potatoe, &c.

SEMINAL-Root, in *Natural History*, a name given by Grew to that part of the seeds of plants, which may otherwise be called the inner body of the seed: this is distributed through the parenchyma of the seed, but is wholly different from it; and distinguished by Dr. Grew from the radicle, which becomes the plant-root in its future growth. The parenchyma of the seed is, in some degree, that to the feminal-root, which the mould or earth is to the plant-root, or radicle; and the feminal-root is to the plant-root, what the plant root is to the trunk.

SEMINALIS, in *Botany*, a name by which some authors have called horsetail.

SEMINARA, in *Geography*, a town of Naples, in Calabria Ultra; destroyed by an earthquake in 1783, though the inhabitants escaped; 17 miles N.N.E. of Reggio.

SEMINARY, a place appointed for the instruction of young persons destined for the ministry, in its duties, ceremonies, and offices; first instituted, as Thomassin tells us, by St. Augustine.

Of these seminaries there are many abroad, furnished with halls for the assemblies of the exercitants, and little cham-

bers, or cells, where each person retires, studies, and prays, apart. Such is the seminary of St. Sulpitius, at Paris.

The council of Trent decrees, that children exceeding twelve years of age be taken, brought up, and instructed in common, to qualify them for the ecclesiastical state; and that there be a seminary of such belonging to each cathedral, under the direction of the bishop.

In France, the establishment of seminaries was somewhat different from the decree of the council; none are taken in but young people ready to study theology, and to be ordained: so that the seminaries were a kind of houses of probation, where the vocation of clerks is examined, and they are prepared to receive orders. And by an edict of 1749, no seminary could be established without letters patent from the king.

For the subsistence of these seminaries, there are several unions of benefices, or else the clergy of the diocese are obliged to contribute to maintain them.

Pope Pius IV. having established a seminary at Rome, in consequence of the decree of the council of Trent, by advice of the cardinals, it was given to the Jesuits, who have made very good use of it.

SEMINARY, among the canons of St. Augustine, is used for a kind of college, or school, where pensioners are kept, and instructed in classical and other learning; and this among us is the popular sense of the word.

The houses of the society *de propaganda fide*, established for the preparing of ecclesiastics for missions among infidels and heretics, are also called seminaries. The principal of which is that at Rome, called the *apostolical college*, *apostolical seminary*, *pastoral seminary*, *seminary of the propaganda*, &c. See **PISTOIA**.

SEMINARY is now used among us in the same sense with *school*; which see.

SEMINARY, in *Gardening*, the term used for the seed-plot, or place allotted for raising plants from seed, and keeping them till they are fit to be removed into the garden, or nursery.

When the seminary is intended for trees, it must be proportioned to the quantity of seeds sown, and of a soil adapted to the generality of the trees intended to be raised in it. The land should be good, and the situation warm, and well defended, and as near the nursery as possible. A fertile mead, or rich pasture, lowly situated, will be very proper for the purpose. In preparing the seminary, let the ground be double dug, working the sward to the bottom, which operation may be performed in winter. In the spring, the weeds must be constantly kept down; and about Midsummer, if the soil is not naturally very rich, some rotten dung should be spread over the surface of the ground, which should be then trenched, or double dug afresh. From Midsummer till September, the ground must be kept clean from weeds, and just before the seeds are committed to it, it should be double dug afresh; at which time the parts must be wholly incorporated. When this is done, the ground must be levelled, and the beds laid out for the different purposes wanted; reserving such a portion of it as will be wanted for the reception of those seeds which are to be sown in the spring.

The seminary must be divided into different apartments, for the different sorts of seeds, according to their nature; those seeds that are sown in autumn being sown in a part by themselves; those in the spring in another. Those seeds, which remain till the second spring before they come up, should be all sown in beds contiguous to each other; and those, which often continue three years, must be sown by themselves. When the plants produced in any of the apartments

apartments are taken off for the nursery, the ground should be double dug, and lie fallow the following summer, manuring it with rotten dung, and double-digging it about Midsummer, as before. In autumn it will be ready to be sown afresh, which should be done with seeds of a different nature from those by which it was before occupied. The seminary should be well fenced and guarded. The seminary which is most in use is for the supply of the flower-garden, and this is the place where flowers are to be raised from their seeds, to procure varieties, or, as the florists express it, new flowers: as also for the sowing of all the biennial plants, to succeed those which decay in the flower-garden.

The seminary should always be situated at some distance from the house, and be walled or paled round, and kept under lock and key, to keep out dogs, &c. and to prevent a great deal of damage that is frequently done by those who are not acquainted with gardening before they are aware of it. The several directions for the management of the seminary are to be seen under the names of the several plants intended to be raised in it.

SEMINATION, in *Agriculture*, the act of sowing grain or other sorts of seed. It is of much consequence to have this performed in as equal and regular a manner as possible; the crops being thereby much better, and more productive. See **SOWING**.

SEMINERVOSUS, in *Anatomy*. See **SEMITENDINOSUS**.

SEMINIFEROUS Tubes or *Ducts*, the innumerable fine canals composing the body of the testis, into which the seminal fluid is secreted. See **GENERATION**.

SEMINIUM, a term used by the writers on fossils to express a sort of first principle, from which the several figured stones, or, as they are more usually called, the extraneous fossils, are supposed to have their origin.

The generality of the learned world, at this time, supposed these to be the remains of real shells, &c. brought from the sea to the places where they are now found, at the time of the universal deluge. See **FORMED STONES**, and **ADVENTITIOUS FOSSILS**.

But those who dissent from this system pretend, that these fossile bodies, though they exactly represent shells, &c. yet never were in the sea at all, but that their minute first principles, or, to use their own term, their seminia, have been carried from the sea, through subterranean passages, to the places where we now find the complete shells, &c. into which they have grown. Langius, who has written expressly on this subject, though he has candidly collected all that has been said in favour of the diluvian system, by the abettors of it, yet is not convinced by those arguments, but rather inclines to the other side of the question, or the rise of such fossils from seminia.

These fossile shells are usually found throughout one and the same substance, and that the most different imaginable from the substance of the living creatures which they represent; and often, though found in pairs, and perfectly closed on all sides, yet when broken, they are found full of the substance of the stone in which they lie; and the armature of several kinds of them, particularly of many of the cornua ammonis, is supposed to plead greatly in favour of this hypothesis; as it is not of the nature of or at all owing to the substance of the matrix in which they lie, or of the matter of which they are formed, and is therefore to arise solely from the nature of the seminum from which they are formed.

The immense number of the sea-shells, as they are called, thus found fossile, is also thought to argue much on this side of the question; as the favourers of this hypothesis suppose

that the sea could not, at any one time, have given up such numbers as the earth is stocked with, though there are no limits to the numbers supposed to be raised from seminia; and the immense columns of black marble found in Ireland, and found of such regular joints, are brought as a proof of the possibility of such a formation of fossils as this from seminia, which they suppose must have given origin to those pillars.

SEMINOLES, in *Geography*, a division of the Creek nation of Indians, who inhabit the flat level country on the rivers Apalachicola and Flint.

SEMIORBITALARES ORIS, *Superior* and *Inferior*, in *Anatomy*, the names under which Winslow describes the orbicularis oris. See **DEGLUTITION**.

SEMI-ORDINATES, in *Geometry*, the halves of the ordinates or applicates. See **ORDINATE** and **CONIC SECTIONS**.

SEMI-PARABOLA, a curve defined by the equation, $ax^{m-1} = y^m$; as $ax^2 = y^3$, $ax^3 = y^4$.

In semi-parabolas $y^m : v^m$ ($:: ax^{m-1} : az^{m-1}$) $:: x^{m-1} : z^{m-1}$, or the powers of the semi-ordinates are as the powers of the abscissas, one degree lower; *e. gr.* in cubical semi-parabolas, the cubes of the ordinates y^3 and v^3 are as the squares of the abscissas x^2 and z^2 . See **PARABOLA**.

SEMI-PELAGIANS, in *Ecclesiastical History*, a name anciently, and even to this day, given to such as retain some tincture of Pelagianism.

St. Prosper, in a letter to St. Augustine, calls them *reliquias Pelagii*.

Many learned men, principally among the Gauls, who could not come into St. Augustine's doctrine of grace, &c. were accused of Semi-pelagianism; they were also called *Masilians*, or *priests of Marseilles*, in regard their opinions had their first rise in that city.

Cassian, who had been a deacon of Constantinople, and was afterwards a priest at Marseilles, was the chief of these Semi-pelagians. And about the year 430, several other persons embarked in the undertaking of fixing upon a kind of mean between the opinions of Pelagius and those of Augustine, and formed this new sect.

The leading principles of the Semi-pelagians were the five following. 1. That God did not dispense his grace to one more than another in consequence of predestination, *i. e.* an eternal and absolute decree, but was willing to save all men, if they complied with the terms of his gospel. 2. That Christ died for all men. 3. That the grace purchased by Christ, and necessary to salvation, was offered to all men. 4. That man, before he received grace, was capable of faith and holy desires. 5. That man was born free, and was consequently capable of resisting the influences of grace, or of complying with its suggestion. The Semi-pelagians were very numerous; and the doctrine of Cassian, though variously explained, was received in the greatest part of the monastic schools in Gaul, from whence it spread itself far and wide through the European provinces. As to the Greeks, and other eastern Christians, they had embraced the Semi-pelagian doctrine before Cassian, and still adhere firmly to it. In the sixth century, the controversy between the Semi-pelagians and the disciples of Augustine, prevailed much, and continued to divide the Western churches. Mosheim's *Eccl. Hist.* vol. i.

SEMI-PERIOD, in *Grammar*, a mark of distinction recommended by Dr. Ward, but not admitted by other grammarians. It is greater than the colon, and supposed to answer the same purpose between the colon and period as the semicolon does between the comma and colon. It is used to terminate a perfect sentence, when a new sentence arising out of

of the preceding is annexed to it; and he distinguishes it by beginning the new sentence with a small letter. But the colon and semicolon, differently applied, supersede the necessity of his new distinction.

SEMPOLATNOI, or **SEMPALAT**, in *Geography*, a fortress of Russia, in the government of Kolivan, on the Irtsch, first built in the year 1714, on the bank of the Irtsch; but afterwards taken down and erected in several different situations. It now stands in its fourth situation, and is easily commanded from the mountains that lie to the east of it; and the adjacent country is very pleasant and fertile, but remains uncultivated. The gardens at Sempalat yield a very fine species of melons. The fort derives its name from Sempalat, a ruinous town, distant from it about 16 versts on the river Irtsch, where are seen some remains of old stone buildings. The Russian settlers found here seven houses, as the name of the place imports. Some learned men are of opinion, that certain inscriptions found among the ruins, relate to the mythology of the Kalmucks; and that this place was deserted by these people, in conformity to a maxim of their religion, that when any consecrated place is profaned by war, it should be for ever relinquished; 148 miles S. of Kolivan. N. lat. $50^{\circ} 25'$. E. long. $80^{\circ} 14'$.

SEMI-PORCELLANÆ, in the *History of Shells*. See **SHELLS**.

SEMIPREBEND. See **PREBEND**.

SEMIPROOF, an imperfect proof.

In the French law, the deposition of a single evidence only makes a semiproof.

The testament of a person deceased is deemed a semiproof.

In enormous cases, the semiproof frequently determined them to try the torture.

SEMIQUARTILE, or **SEMIQUADRATE**, is an aspect of the planets, when distant from each other 45 degrees, or one sign and a half.

SEMIQUAVER, in *Music*. See **QUAVER**.

SEMIQUINTILE is an aspect of the planets, when at the distance of 36 degrees from one another.

SEMIRA, in *Geography*. See **SAMIRA**.

SEMIRAMIS, in *Geography*, queen of Assyria, a very distinguished personage in ancient history, lived at a period so remote, that little can be known with certainty of her actions. It appears, however, that Semiramis was a female of obscure origin, but of great beauty and a superior understanding, and that she became the wife of Menon, an officer of high rank under king Ninus; that following her husband to the army, she engaged in the invasion of Bactra, and attracted the king's notice, whom he afterwards married, her former husband, through jealousy or despair, having put an end to his life. After the death of Ninus, who left her regent and guardian of their infant son, she assumed the reins of empire, and governed with great glory. She founded the famous city of Babylon: then pursuing her husband's plan of conquest, and marching through Media and Persia, every where, it is said, leaving traces of her splendour, in works of magnificence and utility, penetrated to the banks of the Indus. She there encountered the king of the country, at the head of a vast army, and underwent a total defeat, which obliged her to return to Bactra with scarcely a third part of her forces. A conspiracy being then formed to assassinate her, at the instigation of her own son, she either fell under it, or was obliged to resign her crown after wearing it upwards of 40 years.

SEMIREVERBERATORY Fire, in *Chemistry*, a term

used to express such a reverberatory fire, in which the flame is only beaten back upon the bottom of the vessel.

SEMIRHOMBUS, in *Surgery*, a sort of bandage.

SEMIRUS, in *Ancient Geography*, a navigable river of Italy, in Brutium, the country of the Locri, according to Pliny.

SEMIS, among the Romans, the half of the *as*.

SEMISAT, in *Geography*. See **SAMISAT**.

SEMISEXTILE, or **SEMISEXTUS**, or **S. S.** an aspect of two planets, wherein they are distant from each other one-twelfth part of a circle, or 30 degrees.

The semisextile was added to the ancient aspects by Kepler; and, as he says, from meteorological observations.

SEMISICILICUS, a word used by some pharriacutic writers to express a drachm.

SEMISIDERATUS, a word used by some for a person struck with a hemiplegia.

SEMISOSPIRO, in the *Italian Music*, a little pause, or the eighth part of a bar in common time.

SEMISPINALIS DORSI, in *Anatomy*, a portion of the muscular mass, which fills the hollow of the spine between the transverse and the spinous processes. It arises from the transverse processes of four, five, six, or seven of the inferior dorsal vertebræ, beginning with the second from the loins, and is inserted in the spinous processes of the two lowest cervical, and of the two, three, or four first dorsal vertebræ. It lies on the multifidus spinæ, with which it is much connected; and it is covered by the longissimus dorsi and complexus. It is described as a distinct muscle by Albinus and Soemmerring; Boyer and Bichat include it with the multifidus spinæ under the name of transverse épineux. See **MULTIFIDUS**, under which article its action is described.

SEMITA LUMINOSA, a name given to a kind of lucid tract in the heavens, which a little before the vernal equinox, or after the autumnal, may be seen about six o'clock at night, extending from the western edge of the horizon, up towards the Pleiades.

The phenomenon has been taken notice of by Cassini and Fatio, who both evince, that this light comes diffused from both sides of the sun. Its brightness is much the same with that of the via lactea, or the tail of a comet: it is seen plainest with us about the beginning of October, or the latter end of February.

Fatio conjectures, that the bodies, or rather the congeries or aggregate of bodies, which occasions this light, conforms to the sun like a lens, and takes it to have ever been the same; but Cassini thinks it arises from a vast number of small planets, which encompass the sun, and give this light by reflection; esteeming it also not to have existed long before he observed it. See **ZODIACAL Light**.

SEMITALES, among the Romans, a name given to the gods who were the protectors of roads.

SEMITEINTS. See **TEINTS**.

SEMITENDINOSUS, (feminevofus; ischio-pré-tibien,) in *Anatomy*, a long muscle at the back of the thigh, thicker above and very slender below, extending from the tuberosity of the ischium to the tibia. It arises from the ischium by a tendon, which, for the space of three inches, is common to it with the long head of the biceps flexor cruris. The muscular fibres arising from this tendon form a fasciculus, which is first slender, then larger, and then again diminished, and intersected in its middle by an aponeurosis very obliquely directed. The semitendinosus passes along the inner and posterior edge of the thigh, and terminates below in a tendon, which first constitutes

constitutes the sharp edge of the inner ham-string, then goes behind the internal condyle and the knee-joint, sends off an expansion, which contributes to the formation of the aponeurosis of the leg, turns round the head of the tibia, and spreads into a flat form to terminate on the anterior surface of that bone, a little below the knee, behind the tendon of the sartorius, and in company with that of the gracilis. Between this tendon, and the internal lateral ligament of the knee-joint, there is a bursa mucosa. The muscle is covered by the fascia of the thigh, and at its origin by the gluteus magnus: it covers the semimembranosus and the adductor longus. The semitendinosus acts on the knee, the hip, and the pelvis, in the same way as the semimembranosus does. See the description of that muscle.

SEMITERTIAN FEVER. See FEVER, *Semitertian*.

SEMITONE, in *Music*, one of the degrees, or concinnous intervals, of concords.

There are three degrees, or less intervals, by which a sound can move upwards and downwards successively from one extreme of any concord to the other, and yet produce true melody; and by means of which, several voices and instruments are capable of the necessary variety in passing from concord to concord. These degrees are the greater and less tone, and the semitone. The ratio of the first is 8:9; that of the second 9:10.

The ratio of the semitone is 15:16; its compass is five commas; which interval is called a semitone, not that it is geometrically the half of either of the tones, for it is more; but because it comes somewhat near it. It is also called the *natural* semitone, and the *greater* semitone, because greater than the part it leaves behind, or its complement to a tone, which is four commas. The Italians also call it *seconda minore*, or a lesser second.

There are several species of semitones; but those that usually occur in practice are of two kinds, distinguished by the addition of greater and less. The first is expressed by the ratio of 16 to 15, or $\frac{16}{15}$; and the second by 25 to 24, or $\frac{25}{24}$. The octave contains ten semitones major, and two diesis, nearly; for the measure of the octave being expressed by the logarithm 1.000000, the semitone major will be measured by 0.093109; and the octave contains seventeen semitones minor, nearly. If the measure of the octave be the logarithm 1.000000, the measure of the semitone minor will be 0.058894. These two differ by a whole enharmonic diesis; which is an interval practicable by the voice, and was much in use among the ancients, and not unknown even among the modern practitioners. Euler, Tent. Nov. Theor. Mus. p. 107. See INTERVAL.

These semitones are called *fictitious notes*; and with respect to the natural tones, are expressed by characters called *flats* and *sharps*.

Their use is to remedy the defects of instruments, which, having their sounds fixed, cannot always be made to answer to the diatonic scale.

By means of these we have a new kind of scale, called the *SEMITONIC Scale*; which see.

In practical music, on keyed and fretted instruments, it is a nominal half-tone; though mathematicians, in theory, find it impossible to divide a tone into halves. Rousseau, after explaining the scientific and nominal difference between the major and minor semitone; the major changing its place, as *e* to *f*, and *b* to *c*; and the minor remaining on the same line, or on the same space of the staff; as *F* to *F*♯, *B* to *B*♯; observes, that though the imaginary change of tone is expressed by the accident of a sharp or a flat, yet there is no difference in the sound of *E* and *F*♯, or in *A* and *B*♭, on

the organ or harpsichord, the same tones being sometimes major and sometimes minor, sometimes diatonic and sometimes chromatic, according to the key we are in.

For the importance of the semitone in music, see Mattheson's *Organisten-probe*, or Treatise on Thorough-bass, where he has bestowed many pages on this interval. Zarlino calls it *il sale*, the salt, or seasoning of music.

The use of semitones has been much abused of late, by the now too common trick of running up and down the piano forte in half-notes. Our slow chromatic is fundamental, and productive of modulation; but the quick chiefly consists of appoggiaturas, and mere notes of taste, unnoticed in the base and the accompaniments. See MODERN CHROMATIC.

For the sober use of successive semitones with good taste and effect, see Mozart's Theme, No 5. Var. 4. second strain.

SEMITONIC SCALE, or the *Scale of Semitones*; a scale or system of music, consisting of 12 degrees, or 13 notes, in the octave, being an improvement on the natural or diatonic scale, by inserting between each two notes of it another note, which divides the interval or tone into two unequal parts, called *semitone*.

The use of this scale is for instruments that have fixed sounds, as the organ, harpsichord, &c. which are exceedingly defective on the foot of the natural or diatonic scale. For the degrees of the scale being unequal, from every note to its octave, there is a different order of degrees; so that from any note we cannot find any interval in a series of fixed sounds; which yet is necessary, that all the notes of a piece of music, carried through several keys, may be found in their just tune, or that the same song may be begun indifferently at any note, as may be necessary for accommodating some instrument to others, or to the human voice, when they are to accompany each other in unison.

The diatonic scale, beginning at the lowest note, being first settled on an instrument, and the notes thereof distinguished by their names, *a, b, c, d, e, f, g*; the inserted notes, or semitones, are called *fictitious notes*, and take the name or letter below with ♯, as *c*♯, called *c sharp*; signifying that it is a semitone higher than the sound of *c* in the natural series; or this mark ♭, called a *flat*, with the name of the note above, signifying it to be a semitone lower.

Now $\frac{16}{15}$ and $\frac{17}{16}$ being the two semitones the greater tone is divided into; and $\frac{15}{16}$ and $\frac{14}{15}$, the semitones the less tone is divided into; the whole octave will stand as in the following scheme, where the ratios of each term to the next are written fraction-wise between them below.

Scale of Semitones.

<i>c.</i>	<i>c</i> ♯.	<i>d.</i>	<i>d</i> ♯.	<i>e.</i>	<i>f.</i>	<i>f</i> ♯.	<i>g.</i>	<i>g</i> ♯.	<i>a</i> ♭.	<i>b.</i>	<i>c</i> ♭.
$\frac{16}{15}$	$\frac{17}{16}$	$\frac{15}{16}$	$\frac{14}{15}$	$\frac{16}{15}$	$\frac{17}{16}$	$\frac{15}{16}$	$\frac{14}{15}$	$\frac{16}{15}$	$\frac{17}{16}$	$\frac{15}{16}$	$\frac{14}{15}$

For the names of the intervals in this scale, it may be considered, that as the notes added to the natural scale are not designed to alter the species of melody, but leave it still diatonic, and only correct some defects arising from something foreign to the office of the scale of music, viz. the fixing and limiting the sounds; we see the reason why the names of the natural scale are continued, only making a distinction of each into a greater and less. Thus an interval of one semitone is called a *less second*; of two semitones, a *greater second*; of three semitones, a *less third*; of four, a *greater third*, &c.

A second kind of semitonic scale we have from another division of the octave into semitones; which is performed by taking an harmonical mean between the extremes of the greater

greater and less tone of the natural scale, which divides it into two semitones nearly equal. Thus, the greater tone 8 : 9 is divided into two semitones, which are 16 : 17, and 17 : 18; where 16 : 17 : 18, is an arithmetical division, the numbers representing the lengths of the chords; but if they represent the vibrations, the lengths of the chords are reciprocal; viz. as 1 : $\frac{1}{16}$: $\frac{1}{18}$; which puts the greater semitones $\frac{1}{16}$ next the lower part of the tone, and the lesser $\frac{1}{18}$ next the upper, which is the property of the harmonical division. And after the same manner the less tone 9 : 10 is divided into the two semitones 18 : 19, and 19 : 20; and the whole octave stands thus:

c. c#. d. d#. e. f. f#. g. g#. a. b. b#. c.
 $\frac{1}{16}$ $\frac{1}{15}$ $\frac{1}{14}$ $\frac{1}{13}$ $\frac{1}{12}$ $\frac{1}{11}$ $\frac{1}{10}$ $\frac{1}{9}$ $\frac{1}{8}$ $\frac{1}{7}$ $\frac{1}{6}$

This scale, Mr. Salmon tells us, in the Philosophical Transactions, he made an experiment of, before the Royal Society, on chords, exactly in these proportions, which yielded a perfect concert with other instruments, touched by the best hands. Mr. Malcolm adds, that, having calculated the ratios thereof, for his own satisfaction, he found more of them false than in the preceding scale; but then their errors were considerably less, which made amends. Malcolm's Music, chap. x. § 2.

SEMIVOWELS, in *Grammar*. See CONSONANTS.

SEMIVULPA, in *Zoology*, a name by which Gesner, and some others, have called the opossum.

SEMIZUS, in *Ancient Geography*, a town of Lesser Armenia, in Melitené. Ptolemy.

SEMLIN, in *Geography*. See ZEMLIN.

SEMLYO, a town of Hungary; 12 miles W.N.W. of Stuhl Weissenburg.

SEMMARA, a town of Naples, in Calabria Ultra; 10 miles W. of Oppido.

SEMMYA, a town of Hindoostan, in Bahar; 14 miles N. of Bahar.

SEMNAN, a town of Persia, in the province of Comis; 40 miles S.W. of Damegan.

SEMNEON, in *Ancient Geography*, a town and episcopal see of Asia, in Pamphylia.

SEMNI, a race of philosophers in India.

SEMNO, in *Geography*, a river of Albania, which runs into the Adriatic; 4 miles W. of Canovia.

SEMNONES, a people of Germany, who, according to Tacitus, boasted of being the most noble among the Suevi.

SEMIDIUS, among the Romans, a measure equal to half the modus, or the sixth part of the amphora.

SEMONES, among the *Ancients*, a class of gods that were of a middle nature between the celestial and terrestrial gods. Justin Martyr has mistaken one of these for Simon Magus. Mem. de l'Acad. des Inscrip. vol. i. p. 270.

SEMOVNIE, in *Geography*, a town of European Turkey, in Bulgaria; 12 miles W. of Nicopoli.

SEMOY, a town of France, in the department of the Forests; 5 miles N.W. of Chiny.

SEMOY, a river of France, which rises near Arlon, and enters the Meuse near Château Renard, in the department of the Ardennes.

SEMPACH, a town of Switzerland, and capital of a bailiwick, situated on a lake to which it gives name; 7 miles N.W. of Lucerne.—Also, a lake of Switzerland, in the canton of Lucerne, six miles long and two wide; 8 miles N.W. of Lucerne.

SEMPERVIVÆ, in *Botany*, a natural order of plants, so termed from one of the principal genera; as also perhaps, more especially, in allusion to the tenaciousness of the living principle, common to the whole order, and to which the said genus owes its name. See SEMPERVIVUM.

VOL. XXXII.

This is the 83d of Jussieu's orders, the first of his 14th class, whose characters may be found at length under the article FICOIDEÆ. The *Sempervivæ* are defined as follows.

Calyx inferior, divided deeply into a definite number of segments. *Petals* inserted into the bottom of the calyx, alternate with its segments, and agreeing with them in number, or more rarely the *corolla* is monopetalous, either tubular, or deeply divided. *Stamens* either as many as the petals, and alternate therewith; or twice as numerous, inserted alternately into the claws of the petals, and the bottom of the segments of the calyx; anthers roundish. *Germens* several, equal in number to the petals, joined together by the internal angle of their base, glandular at the opposite part, their glands, in some instances, assuming the form of scales; styles and stigmas as many as the germens. *Capsules* as many, of one cell, with many seeds, separating at the inner margin into two valves, whose edges bear the seeds. *Corculum* incurved, surrounding a farinaceous mass. *Stem* herbaceous, or somewhat shrubby. *Leaves* opposite or alternate, succulent.

The genera are *Tillæa*, *Craffula*, *Cotyledon*, *Rhodiola*, *Sedum*, *Sempervivum*, and *Septas*; to which *Penthorum* is subjoined, as akin to the rest, but differing in habit, (as being not succulent,) and in "the mode in which the capsule bursts;" see PENTHORUM, where Jussieu's mistake is rectified, and this genus referred to the order in question, without any exception or doubt.

SEMPERVIVUM, a name which immediately bespeaks its own derivation, *semper vivens*, ever-living, or evergreen; the plants which compose this genus being from their very succulent nature so extremely tenacious of life.—Linn. Gen. 244. Schreb. 329. Willd. Sp. Pl. v. 2. 930. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 522. Prodr. Fl. Græc. Sibth. v. 1. 334. Ait. Hort. Kew. v. 3. 171. Juss. 307. Lamarck Illustr. t. 413. Gærtn. t. 65.—Class and order, *Dodecandria Dodecagynia*. Nat. Ord. *Succulentæ*, Linn. *Sempervivæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, permanent, deeply cloven into about twelve, concave, acute segments. *Cor.* Petals twelve, oblong, lanceolate, acute, concave, a little larger than the calyx. Nectaries usually wanting. *Stam.* Filaments twelve, slenderly awl-shaped; anthers roundish. *Pist.* Germens twelve, superior, placed in a circle, erect, terminating in the same number of spreading styles; stigmas acute. *Peric.* Capsules twelve, oblong, compressed, short, ranged circularly, pointed outwardly, opening inwardly. *Seeds* numerous, roundish, small.

Eff. Ch. *Calyx* inferior, in twelve deep segments. Petals twelve. Capsules twelve, with many seeds.

Obf. Linnæus in a remark under the natural character in his *Gen. Pl.* makes the greater number of petals the essential distinction between this genus and *Sedum*, but in the *Syst. Veg.* the nectariferous scales are properly made characteristic of the latter. According to this principle, *Sempervivum sediforme*, of Jacquin, has been referred by sir J. E. Smith, in Tr. of Linn. Soc. v. 10. 6, to *Sedum*, with which it accords also in habit, differing altogether from *Sempervivum*, except in number of petals, &c. a circumstance known, in this case, to be uncertain. Nevertheless, there being in *Sempervivum hirtum*, according to Schmidel's figure at least, a minute indication of a scale, or tooth, at the base of each germen, the learned editor of Hort. Kew. was induced, on that ground alone, to prefer the character deduced from number, in the above plant of Jacquin. Both Willdenow and Martyn enumerate fourteen species of this handsome genus, including *Sediforme*; many of these are beautifully figured by Jacquin and Curtis. The following, beginning with the only British species, may serve as an epitome of the whole.

F f

S. tetorum.

S. tectorum. Common Houseleek. Linn. Sp. Pl. 664. Engl. Bot. t. 1320. Curt. Lond. fasc. 3. t. 29. Fl. Dan. t. 601.—Leaves fringed. Offsets spreading. Common on old tiles and decayed thatched roofs, where it forms large, dense tufts, flowering, though sparingly, in July.—*Roots* perennial, fibrous, throwing out numerous, rosaceous, leafy runners. *Stems* erect, nearly a foot high, round, fleshy, downy, leafy, corymbose at the top, many-flowered. *Leaves* extremely succulent, carinated, acute; the radical ones obovate; those of the stem alternate, lanceolate, more slender, reddish. *Flowers* pale pink, or flesh-coloured, downy.—“The bruised leaves are by rustic surgeons used as a cooling external application, but their virtues are inconsiderable.”

S. globiferum. Globular Houseleek. Linn. Sp. Pl. 665. Curt. Mag. t. 507. Jacq. Austr. v. 5. t. 40. App.—Leaves fringed. Offsets resembling little globes.—Native of Russia and Germany, flowering in June and July.—*Roots* perennial, resembling those of the last species in habit, as indeed do all the other parts. *Stems* not so high, more leafy. *Leaves* narrower, closely fringed, tipped with red; those of the globular offsets compactly imbricated. *Flowers* large and handsome, in a terminal cluster; their petals yellow, and lilac coloured at the base.

S. tortuosum. Gouty Houseleek. Ait. Hort. Kew. v. 3. 173. Willd. n. 8. Curt. Mag. t. 296.—Leaves obovate; gibbous and hairy beneath. Nectaries two-lobed.—Native of the Canary Islands, flowering in July and August.—A shrubby plant of humble growth, producing numerous fleshy evergreen leaves growing thickly together, in clusters, on the offsets; those of the stem ovate, smaller, coloured. *Flowering stems* numerous, each supporting many starry, elegant, bright yellow flowers.

S. arachnoideum. Cobweb Houseleek. Linn. Sp. Pl. 665. Curt. Mag. t. 68. Jacq. Austr. v. 5. t. 42. App.—Leaves interwoven with hairs. Offsets globular.—Native of the Alps of Italy and Switzerland, flowering in the summer.—This very elegant species, commonly known by the name of *Cobweb Sedum*, resembles all the other species in habit, but is exceedingly remarkable for a woolly substance on the top of its globular offsets, which, as the leaves expand, is extended with them, and assumes the appearance of a cobweb, whence the specific name. *Flower-stalks* about six inches high, of a bright pink colour, like the stem-leaves. *Flowers* terminal, corymbose, pink or reddish.

S. montanum. Mountain Houseleek. Linn. Sp. Pl. 665. Jacq. Austr. v. 5. t. 41. App.—Leaves not fringed. Offsets spreading.—Native of Switzerland, flowering in June and July.—This elegant species differs chiefly from *S. tectorum* in having smaller leaves without any fringe or indenture at their edges, and more expanded offsets. *Flowers* beautifully variegated with lilac and a brownish-red colour.

S. monanthes. Clustered or Dwarf Houseleek. Ait. Hort. Kew. v. 3. 174. Willd. n. 14. Curt. Mag. t. 93.—Leaves roundish, club-shaped, clustered together. Stalks solitary, generally single-flowered. Nectaries obovate.—Native of the Canary Islands, flowering in July.—Remarkable as being by far the smallest species of *Semprevivum*, but more so on account of its nectaries, which are usually seven in number, and form a principal part of the fructification.

The remaining species are *S. arboreum*, *canariense*, *glutinofum*, *glandulosum*, *villosum*, *stellatum*, and *hirtum*.

SEMPERVIVUM, in Gardening, contains plants of the succulent, hardy, herbaceous, evergreen, and shrubby perennial kinds, of which the species cultivated are; the common houseleek (*S. tectorum*); the globular houseleek (*S. globiferum*); the cobweb houseleek (*S. arachnoideum*); the mountain houseleek (*S. montanum*); the tree houseleek (*S. arboreum*); and the Canary houseleek (*S. canariense*).

In the sixth fort a variety with variegated leaves was obtained from a branch accidentally broken from a plant of the plain fort, at Badmington, the feat of the duke of Beaufort.

Method of Culture.—The different herbaceous forts are all capable of being increased without difficulty, by planting their off-set heads, which should be slipped with a few root-fibres to them, and planted in the spring season on rubbish, rock-works, or other places, or in pots for variety: and the tender greenhouse forts may be raised from cuttings of the branches and from seeds; but the first is the better method. The cuttings should be made from the smaller branches in the early summer months, and be planted out in pots, or a bed of fine earth, in a warm shaded situation: where the cuttings are succulent, they should be laid in a dry place for a few days to heal over the cut part; they should be shaded from the sun; and those in pots lightly watered in dry weather: when they are become well rooted, they should be carefully removed into separate pots of a middle size, being placed in the greenhouse. Some forward these plants by means of bark hot-beds.

The seeds of the Canary kind should be sown in the autumn or early spring in pots of light mould, placing them in a garden-frame to protect them from frost, having the air freely admitted in mild weather: when the plants are come up, and have a little strength, they should be removed into small pots and placed in the greenhouse.

The first forts are ornamental on walls, buildings, and rock-works, as well as in pots; and the last two kinds among other potted greenhouse plants.

SEMPHIROPOL, in Geography, a town of Russia, in the province of Tauris; 60 miles S. of Perekop. N. lat. 45° 8'. E. long. 34° 10'.

SEMPHORIS, in *Ancient Geography*, a town situated in the environs of Galilee, according to Josephus.

SEMPRONIUS, in *Geography*, a post-town of New York, nearly in the centre of the county of Onondago, within the jurisdiction of the township of Scipio, 20 miles S.E. from the ferry on Cayuga lake, and 457 miles from Washington.

SEMP, a river of Bavaria, which runs into the Isar, 5 miles above Landshut.

SEMRAH, a town of Hindoostan, in Bahar; 38 miles N. of Chuprah. N. lat. 26° 45'. E. long. 84° 51'.

SEMSAT. See SAMISAT.

SEMSHIN, or SEMPTCHIN, a town of Little Bucharia; 18 miles E.S.E. of Tourfan. N. lat. 44° 30'. E. long. 89° 49'.

SEMTCHIARSKOI, a fortress of Russia, on the Irtysh. N. lat. 51°. E. long. 78° 10'.

SEMUR, or SEMUR en Auxois, a town of France, and principal place of a district, in the department of the Côte d'Or, seated on a rock, near the river Armançon; 10 miles N.W. of Dijon. The place contains 4295, and the canton 14,782 inhabitants, on a territory of 277½ kilometres, in 28 communes. Its principal commerce consists in woollen cloth of its own manufacture. N. lat. 47° 29'. E. long. 4° 23'.

SEMUR en Briennois, a town of France, in the department of the Saône and Loire, and chief place of a canton, in the district of Charolles; 12 miles S. of Charolles. The place contains 598, and the canton 11,106 inhabitants, on a territory of 182½ kilometres, in 16 communes. N. lat. 46° 16'. E. long. 4° 10'.

SEMUSSYR, one of the Kurilskoy islands, 30 versts from Ketoi, another of the same islands. Its length is 130 versts, and its breadth not more than 10. This island has four mountains, one of which exhibits evident traces of its

its having been formerly burnt: in other respects it has the same properties with those of *Ketoi*; which see. The passage from this island to Thirpo Oi is 200 versts.

SEMYDA, in *Botany*, the name of a tree, mentioned by Theophrastus, and by some supposed to be the same with the *betula*, or birch-tree, but very erroneously.

SEMYSTA, in *Ancient Geography*, an island of the British ocean, near the coast of the Osismii, in which the Gauls had a celebrated oracle, according to Pomponius Mela.

SEMZA, in *Geography*, a town of Russia, in the government of Archangel; 16 miles N.N.E. of Mezen.

SENA, or MARZALI, a town of Africa, in the country of Mocaranga, on the river Zambeza, where the Portuguese have a factory. S. lat. $17^{\circ} 35'$. E. long. $35^{\circ} 20'$.

SENA, *Senna*, or *Egyptian Cassia*, in the *Materia Medica*, a purgative leaf much used in draughts and compositions of that intention.

The shrub which bears it is a species of *cassia*; which see.

There is also a kind of fena growing about Florence; but it is inferior to that of the Levant, as is owned by the Italians themselves. Father Plumier mentions also a third kind growing in the Antilles islands.

M. Lemery distinguishes three sorts of fena of the Levant: the first brought from Seyda, called *fena of apalto*, that is, *custom fena*, by reason of the custom paid the grand signior, for the privilege of exporting it; the second comes from Tripoli; the third is called *fena of Mocha*.

Sena is a native of Egypt, the best of which is said to grow in the valley of Balabras, or of Nubia: it also grows in some parts of Arabia, especially about Mocha; but as Alexandria has ever been the great mart from which it has been exported into Europe, it has long been distinguished by the name of Alexandrian fenna or fena.

The best fena, named in Nubia "guebelly," grows wild, and yields two crops of leaves, the abundance of which depends on the periodical rains. The first crop is collected after the first rains, about the middle of September; the second in the following March. The plants are cut down, and exposed on the rocks to dry in the sun. The leaves are then picked, packed up in bales, and sent down to Alexandria, where they are mixed with two other species of cassia: the one the *C. fenna* of Forskal, with obtuse leaves; the other probably the *C. angustifolia* of Willdenow, the leaves of which are longer, narrower, and sharper pointed than those of the proper fena, and come from Mocha. There is reason also for thinking that it is further adulterated with the leaves of *colutea*, bladder-fena, and of box. The fena, after being thus mixed, is repacked in bales at Alexandria, whence it is exported to Europe.

M. Blondel, who was French consul at several sea-ports of the Levant, informs us, that the true fena grows only in the woods of Ethiopia, and in Arabia; and that the fena, which was brought from Saide and Tripoli, was carried there by the caravans; and this opinion is strengthened by the negative testimony of Alpinus, who, in his book "*De Plantis Aegypti*," does not notice fena. But as Hasselquist found this plant growing spontaneously in Upper Egypt, Blondel's assertion is not to be implicitly received. Sena appears to have been cultivated in England in the time of Parkinson, A.D. 1640.

The odour of fena leaves is faint, rather disagreeable, and sickly; the taste slightly bitter, sweetish, and nauseous. Boiling water extracts about one-third of the weight of the leaves employed: the infusion has a deep reddish-brown colour, with the odour and taste of the leaves. This infusion, when exposed to the atmosphere, deposits a lemon yellow-coloured insoluble matter; and a similar precipitate is produced by oxymuriatic acid, and several other substances. Alcohol

and sulphuric ether, digested on the powdered leaves, acquire a deep olive-green colour. When the ethereal tincture is poured on the surface of pure water, a dark olive pellicle remains after the evaporation of the ether, which is almost insipid, and has all the properties of resin; and a golden colour is communicated to the water. This colour may be produced by some extractive being taken up by the ether, closely united to the resin. The alcoholic tincture is rendered only slightly milky by the addition of water, and scarcely any precipitate is produced; but a copious one is thrown down by oxymuriatic acid. The active principle of fena appears to be a very oxidizable extractive, resin, and a peculiar volatile matter; and it contains also mucus, and some saline ingredients. According to Buillon Lagrange, the residue of the watery infusion evaporated to dryness, and burnt, yields potash, sulphate of potash, carbonate of lime, magnesia, and silica.

It is in common use as a purgative, generally operating under four hours after it is taken; and is well adapted for all cases, in which the bowels require certain, but moderate, evacuation (see *CASSIA Senna*); and though it be not easily accounted for, its bitterness aids its operation. To this purpose Dr. Cullen remarks, that when fena was infused in the infusion amarum, a less quantity of the fena was necessary for the dose than the simple infusion of it. Sena, however, when infused in a large proportion of water, as a drachm of the leaves to four ounces of water, rarely occasions much pain of the bowels; and to those who do not object to the bulkiness of the dose, may be found to answer all the purposes of a common cathartic, its operation being aided by plentiful draughts of weak broths or gruel. The dose, in substance, is from a scruple to a drachm; in infusion, from one drachm to three or four. It gives out its virtue both to watery and spirituous menstrua; communicating to water and proof spirit a brownish colour, and to rectified spirit, a fine green. The two inconveniences attending the use of this medicine, are its being liable, in most constitutions, to occasion gripes, and its being accompanied with an ill flavour, which is apt to nauseate the stomach and palate. The griping seems to be occasioned by the resinous matter, as the infusion made with cold water does not gripe, although it purges. The first may be greatly obviated by dilution; the latter by aromatic and other additions; *e. gr.* cinnamon, or a drachm or two of its distilled water, or caraway, or cardamom seeds. The decoction is a bad form in which to administer this drug, as its activity is much impaired by boiling; owing, according to Grew, to the total dissipation of the nauseous and volatile principles; but, as Thomson conceives, to the oxydizement of the extractive, which also accounts for the severe gripings occasioned by the decoction.

Several compositions of this kind are prepared in the shops, sufficiently palatable, and which operate for the most part with ease and mildness. Such are the following: *viz.* *confection of fena*, the electuary of fena of the Lond. Ph. of 1787, and the lenitive electuary of P. L. 1745 and 1720. (See *ELECTUARY of Sena*.) The Dublin pharmacopeia directs the electuary of fena to be prepared by taking of fena leaves, in very fine powder, 4 ounces; pulp of prunes, 1 pound; pulp of tamarinds, 2 ounces; molasses, $1\frac{1}{2}$ pint; and essential oil of caraway, 2 drachms. Boil the pulps with the syrup, to the thickness of honey; then add the powder; and when the mixture is nearly cold, the oil: finally, mix the whole thoroughly together.

These electuaries furnish a mild and pleasant purgative, and well adapted for those who are afflicted with habitual costiveness, and also for pregnant women. The dose is from 3j to 3iv, or more, taken at bed-time.

Extract of Sena. See CASSIA.

As the activity of sena is impaired by the preparation of it in the form of a decoction, it must necessarily suffer much more in this preparation. The extract is black, shining, and tenacious, and has an odour similar to that of wort, and a bitterish taste. It is almost inert as a purgative, and might properly be altogether rejected.

However, some have highly extolled M. Geoffroy's dry extract, which is made of a very strong infusion, evaporated to a dry and pulverizable substance. This, they say, is easily taken, of no ill taste, and operates in a very small quantity, one-third part containing the virtue of the whole, or nearly so; the nicest calculations shewing, that 24 grains of the extract, some part of which may be supposed to be earth, or other accidental or useless matter, possesses the virtues of a drachm in substance. Mem. de l'Acad. des Scienc. Paris, 1738.

Infusion of Sena. See CASSIA.

The Dublin pharmacopeia directs this infusion to be prepared by taking 3 drachms of sena leaves, half a drachm of lesser cardamom seeds, freed from the capsules and bruised, and boiling water, as much as will yield, when strained, 6 ounces by measure. Digest for an hour, and when the liquor is cold, strain it. These infusions will spoil in warm weather in 48 hours; and by simple exposure to the air, attract oxygen, which occasions a yellowish precipitate of oxydized extractive, that gripes violently, but is not purgative; on which account they should be preserved in a well-closed vessel, and made only when wanted. They are also precipitated by the strong acids, the alkaline carbonates, lime-water, solutions of nitrate of silver, oxymuriate of mercury, superacetate of lead, tartarized antimony, and infusion of yellow cinchona bark, which are consequently incompatible in formulae with those infusions. The infusions now mentioned contain all the purgative principles of the plant, and the aromatics correct its griping properties. They are given alone, or more generally combined with neutral salts and manna. The dose of the simple infusions may be from f ʒij to f ʒiv; but with the addition of ʒj of the tartrate of potash, or ʒij of the sulphate of magnesia, which are the usual adjuncts, f ʒij are sufficient.

Infusion of Tamarinds and Sena is prepared, according to the Edinb. Ph., by taking of preserved tamarinds, 1 ounce; sena leaves, 1 drachm; coriander seeds, bruised, half a drachm; raw sugar, half an ounce; and boiling water, 8 ounces. Macerate in a covered earthen vessel, which is not glazed with lead, shaking frequently, and after 4 hours strain. It may be made with double or triple the proportion of sena. This infusion is made, according to the directions of the Dubl. Ph., in the same manner as the infusion of sena, except that ʒj of tamarinds is added, before straining the liquor.

In these infusions, the nauseous taste is covered by the sugar and the acid of the tamarinds; but in other respects they agree both in their properties, and in the effects of the incompatible substances; to which, however, must be added all salts having potash for their base.

Compound Powder of Sena. See CASSIA, and POWDER of Sena.

Tincture of Sena is prepared, according to the Lond. Ph. of 1809, by taking of sena leaves, 3 oz., caraway seeds bruised, 1½ oz., cardamom seeds bruised, 1 dr., raisins itoned, 4 oz., and proof spirit, 2 pints. Macerate for 14 days and filter. The Dubl. Ph. directs to take of sena leaves 1lb., caraway seeds bruised, 1½ oz., lesser cardamom seeds husked and bruised, ½ oz., and proof spirit, a gallon. Digest for 14 days, then filter.

Compound Tincture of Sena, formerly called *Elixir salutis*,

or *Elixir of health*, is prepared by taking of the leaves of sena, 2 oz., jalap root bruised, 1 oz., coriander seeds bruised, ½ oz., proof spirit, 3½ lb. Digest for 7 days, and to the filtered tincture add of refined sugar, 4 oz.

These tinctures are stomachic and purgative: they are very efficacious in flatulent colic, atonic gout, and as an opening medicine for those whose bowels have been weakened by intemperance. The dose is from fʒij to fʒj in any appropriate vehicle.

Syrup of Sena, according to the Lond. Ph., is prepared by taking of sena leaves, 1 oz., fennel seeds bruised, 1 dr., manna, refined sugar, of each 1lb., and boiling water, a pint. Macerate the sena leaves and the fennel seeds in the water for 12 hours; strain the liquor and mix with it the manna and the sugar. The Dubl. Ph. directs to take of manna, refined sugar, of each 1lb., sena leaves, ½ oz., and boiling water, a pint. Let the sena leaves be macerated in the water in a covered vessel for 12 hours; then dissolve the manna and the sugar in the strained liquor.

This syrup contains the purgative properties of the sena, and is chiefly intended for children; but the simple infusion of sena, sweetened with sugar, and with the addition of a little milk, given in the form of tea, is more willingly taken by children, and operates with greater certainty. Lewis. Woodville. Thomson.

SENA, *Bastard*, in Botany. See CASSIA.

SENA, *Bladder*. See COLUTEA.

SENA, *Podded*. See CORONILLA.

SENA, *Scorpion*, *Emerus*, a species of *coronilla*; which see. The leaves of this plant are used, but Boerhaave is unacquainted with any medicinal virtue in them. Ruppian writes, that the common people substitute the leaves instead of those of sena; and Buxbaum tells us, that old women who pretend to medicine, call it *senes blatter*, and use it instead of sena leaves.

SENA, in *Ancient Geography*, a river of Italy, in Umbria, between the Metaurus and the Mifus, according to Silius Italicus.

SENA *Gallica*, *Senagaglia*, a town of Italy, in Umbria, of Gaulish origin, as its name indicates. When the Romans had put the Gauls to flight, they established a colony in this city, towards the year 359. Pompey vanquished Marcus in this place and destroyed it. Ptolemy assigns it to the Senones, from whom it derived its name.

SENA *Insula*, an island, according to Mela, in the British ocean, on the coast of the Orismii. It is now the Isle of Sein or of Saints, on the coast of Bretagne.

SENA *Julia*, *Sienna*, a town of Italy, in Etruria, E. of Volaterræ, from which it is separated by mountains. Different accounts have been given of its origin, from which we may infer, that it is not one of the ancient towns of Etruria. The Romans established a colony in this place in the year of Rome 456, or as others say, 471. A new colony was established in this place in the time of Julius Cæsar, who gave it the name of Julia. In 1370 it was subject to Charles IV.: it suffered much in the wars of the Guelphs and Ghibellines. Charles V. gave the investiture of it to Philip II. his son, who sold it to Cosmo, duke of Florence, in 1558.

SENA *BABA*, in *Geography*, a town of Egypt, on the left bank of the Nile; 13 miles S. of Melatî.

SENA *C*, JOHN, in *Biography*, a distinguished French physician, was born in Gascony, about the close of the 17th century. Little is recorded respecting the progress of his education and life; but he is stated to have been a doctor of the faculty of physic of Rheims, and a bachelor of that of Paris; which last degree he obtained in the year 1724 or 1725. He was a man of profound erudition, united

united with great modesty, and became possessed, by his industry in the practice of his profession, of much sound medical knowledge. His merits obtained for him the favour of the court, and he was appointed consulting physician to Louis XV., and subsequently succeeded Chevcyneau in the office of first physician to that monarch. He was also a member of the Royal Academy of Sciences at Paris, and of the Royal Society of Nancy. He died in December, 1770, at the age of about 77 years, and the king appointed no physician as his successor, as long as he lived.

This able physician left some works, which will probably maintain a reputation as long as medicine is studied. We allude more especially to his treatise on the heart and its diseases, "*Traité de la Structure du Cœur, de son Action, et de ses Maladies*," Paris, 1749, in two volumes, 4to. which is still a standard work upon this interesting subject. An essay "*De reconditâ febrium intermittentium et remittentium naturâ*," Amst. 1759, is generally ascribed to Senac. He also published, when young, an edition of Heister's Anatomy, with some interesting comments and observations of his own, entitled, "*Anatomie d'Heister, avec des Essais de Physique sur l'Usage des Parties du Corps Humain*," Paris 1724, and afterwards "*Discours sur la Méthode de Franco, et sur celle de M. Rau touchant l'Operation de la Taille*," 1727. "*Traité des Causes, des Accidens, et de la Cure de la Peste*," 1744. A work under the assumed name of Julien Morison, entitled "*Lettres sur la Choix des Saignées*," 1730, was from his pen; as well as a paper in the Memoirs of the Academy of Sciences for 1725, under the title of "*Reflexions sur les Noyés*," in which he combatted some erroneous opinions respecting the cause of death by drowning, and the treatment founded upon them. A work, entitled "*Nouveau Cours de Chymie suivant les Principes de Newton et de Stahl*," Paris, 1722 and 1737, has been attributed by mistake to Senac; it was in fact a compilation of notes taken at the lectures of Geoffroy by some students, and is unworthy of his pen. See Eloy, Dict. Hist. de la Médecine.

SENACIA, in *Botany*, a genus of Commerçon's, apparently named by him in honour of the French physician Senac, (see the preceding article,) who might perhaps have patronized the expedition of Commerçon, but of whose botanical merits we find nothing recorded. Jussieu, Gen. Pl. 378, merely mentions this genus under *Celastrus*, as differing from that in having a longer style, oblong anthers, and a fruit with generally two cells, two valves, and six seeds. Our predecessor, the Rev. Mr. Wood, seems to have intended to adopt *Senacia*; see CELASTRUS, at the end. We do not however find that any other writer has done so, nor do we know of what species the genus in question ought to consist, except those mentioned in the place just cited. The precise structure of the capsule, and the number of the seeds, are so little ascertained in some reputed species of *Celastrus*, and the variableness of these characters, in others, is so well known, that while Gärtner himself has even doubted the distinction between EUONYMUS, (see that article,) and *Celastrus* itself, we feel little inclination to subdivide the latter. The comparative length of the styles in these plants, variable in different states of the flowers, can afford no certain mark of generic distinction.

SENAILLE'E, JOHN BAPTISTE, in *Biography*, a French musician, born about 1688. He was a great performer on the violin for his time. Having travelled into Italy, the manager of the Opera at Modena engaged him to perform in his orchestra, and did him the honour to prepare for his reception a seat more elevated than what was allowed

to the rest of the band. The duke desired him to play some solos between the acts of the opera, and he obeyed his serene highness, to the great joy of the whole audience. He has left five books of solos, which had great reputation, till those of Le Claire appeared; which are now as little known as those of Senaillee, though infinitely superior to them. What a fluctuating art is music, and how transient the fame of its professors! since we may be certain, that the works of him who now enjoys the highest reputation, will be for ever plunged into oblivion, at the latest, in a period of 25 years; or appear as ridiculous to our children, as our ancient music now does to us!

SENAMARIBO, in *Geography*, a river of Guiana, which runs into the Atlantic, N. lat. 5° 30'. W. long. 54° 6'.

SE-NAN, a city of China, of the first rank, in the province of Koei-tcheou, surrounded on all sides by mountains; 845 miles S.S.W. of Peking. N. lat. 27° 56'. E. long. 107°.

SENAN, a town of Algiers; 20 miles S. of Oran.

SENANLU, a town of Asiatic Turkey, in Caramania; 30 miles N.W. of Selsekeh.

SENAPSE', a town of Egypt, on the left bank of the Nile; 17 miles W. of Dendera.

SENARPONT, a town of France, in the department of the Somme; 22 miles W. of Amiens.

SENATE, SENATUS, an assembly or council of senators; that is, of the principal inhabitants of a state, who have a share in the government.

Such were the senates of Rome, of Carthage, &c. among the ancients; and such are the senates of Venice, of Genoa, &c. among the moderns.

The senate of ancient Rome was, of all senates, the most celebrated, during the splendour of the republic. Cicero in his oration for Milo, defines it, *templum sanctitatis, amplitudinis, mentis, consiliique publici Romani, caput orbis, ara sociorum, portusque omnium gentium*. The Roman senate exercised no contentious jurisdiction: it appointed judges either out of the senate, or among the knights; but it never stooped to judge any processes in a body. The senate concerted matters of war, appointed who should command the armies, sent governors into the provinces, took order, and disposed of the revenues of the commonwealth. Yet did not the whole sovereign power reside in the senate; it could not alone elect magistrates, make laws, nor decide of war and peace: but in all these cases, the senators were to consult the people. Under the emperors, when the senate became despoiled of most of its other offices, they began to hear causes. For those of less consequence they appointed particular judges; the rest, principally criminal causes, they reserved for their own cognizance, to be judged by them in a body, and that frequently in the emperor's presence. This was put in their way to keep their heads from state affairs. Nero farther committed to the senate the judgment of all appeals; but this did not hold long; nor do we find any footsteps of it any where but in the sixty-second Novel.

With regard to the jurisdiction of the senate, Dr. Middleton observes, that the supreme power at home was in the collective body of the people; yet where haste, perhaps, or secrecy was required, and where the determinations of the senate were so just and equitable, that the consent of the people might be presumed, and taken for granted, the senate would naturally omit the trouble of calling them from their private affairs to an unnecessary attendance on the public; till by repeated omissions of this kind, begun at first in trivial matters, and proceeding insensibly to more serious,

serious, they acquired a special jurisdiction and cognizance in many points of great importance, to the exclusion even of the people; who yet, by the laws and constitution of the government, had the absolute dominion over all. For example:

1. They assumed to themselves the guardianship and superintendence of the public religion; so that no new god could be introduced, nor altar erected, nor the Sibylline books consulted, without their express order.

2. They held it as their prerogative, to settle the number and condition of the foreign provinces, that were annually assigned to the magistrates, and to declare which of them should be consular, and which prætorian provinces.

3. They had the distribution of the public treasure, and all the expences of the government; the appointment of stipends to their generals, with the number of their lieutenants and their troops, and the provisions and clothing of their armies.

4. They nominated all ambassadors sent from Rome, out of their own body, and received and dismissed all who came from foreign states, with such answers as they thought proper.

5. They had the right of decreeing all supplications, or public thanksgivings, for victories obtained, and of conferring the honour of an ovation, or triumph, with the title of emperor, on their victorious generals.

6. It was their province to inquire into public crimes or treasons, either in Rome, or the other parts of Italy; and to hear and determine all disputes among the allied and dependent cities.

7. They exercised a power, not only of interpreting the laws, but absolving men from the obligation of them, and even of abrogating them.

8. In the case of civil dissensions, or dangerous tumults within the city, they could arm the consuls by a vote with absolute power, to destroy and put to death, without the formality of trial, all such citizens as were concerned in exciting them.

9. They had a power to prorogue, or postpone the assemblies of the people; to decree the title of king to any prince whom they pleased; thanks and praise to those who had deserved them; pardon and reward to enemies, or the discoverers of any treason; to declare any one an enemy by a vote; and to prescribe a general change of habit to the city, in cases of any imminent danger or calamity.

The tribunes soon snatched from them that original right, which they had enjoyed from the very foundation of the city, of being the authors, or first movers of every thing, which was to be enacted by the people, and excluded them from any share or influence in the assemblies of their tribes; and though in the other assemblies of the curiæ and the centuries, they seemed to have reserved to them their ancient right, yet it was reduced to a mere form, without any real force; for instead of being what they had always been, the authors of each particular act that was to be proposed to the people's deliberation, they were obliged, by a special law, to authorize every assembly of the people, and whatever should be determined in it, even before they had proceeded to any vote. And C. Gracchus afterwards, in his famous tribunate, used to boast that he had demolished the senate at once, by transferring to the equestrian order the right of judicature in all criminal causes, which the senate had possessed from the time of the kings.

It has been a question among the learned, how senators were created, and how the vacancies of the senate in old Rome were supplied.

Dr. Middleton is of opinion, that the constant and regular

supply of the senate was from the annual magistrates; who, by virtue of their several offices, acquired an immediate right to sit and vote in that assembly. The usual gradation of these offices was that of quæstor, tribune of the people, ædile, prætor, and consul; which every candidate, in the ordinary forms of the constitution, was obliged to take in their order, with this exception only, that he might forego either the tribunate, or the ædileship, at his own choice, without a necessity of passing through them both. See QUÆSTOR, TRIBUNE, &c.

But though these offices gave both an immediate right, and actual entrance into the senate, yet the senatorian character was not esteemed complete, till the new senators had been enrolled by the censors at the next lustrum, or general review of all the orders of the city, which was generally held every five years. Yet this enrolment was but a matter of form, which could not be denied to any of them, except for some legal incapacity, or the notoriety of some crime, or infamy upon their characters; for which the same censors could expel, or deprive any other senator, of what rank or standing soever. See CENSOR.

It has been the opinion of some, that under the kings of Rome the choice and nomination of all the senators depended wholly on the will of the prince, without any right in the people, either direct or indirect; and that the consuls, who succeeded to the kingly power, enjoyed the same prerogative, till the creation of the censors, who ever after possessed the sole and absolute right of making and unmaking senators. But Dr. Middleton is of opinion, that the kings, the consuls, and the censors, acted in this affair but ministerially and subordinately to the supreme will of the people, in whom the proper and absolute power of creating senators always resided. And the doctor assures us, upon the strictest search into the state of the present question, as it stood under the kingly government, he cannot but conclude, from the express testimony of the best historians, the concurrence of similar facts, and the probability of the thing itself, that the right of choosing senators was originally and constitutionally vested in the people. Middleton of Rom. Sen. p. 36.

But lord Hervey, who seems to have studied the Roman history with care and attention, is of a different opinion. The senate, at its first establishment (notwithstanding the judicial and legislative power it afterwards acquired) was nothing more than the king's council. In this light not only Festus, Eutropius, and Livy, represent the senate, but even Dionysius himself. It is therefore highly probable, his lordship says, that each member of this council was merely, as Livy and Plutarch relate, the choice of the king, and not, as Dionysius reports, elected by the people. Nor is there the least ground to imagine, he tells us, from any author whatever, except Dionysius, that during the whole regal government, the people had, directly or indirectly, actually or virtually, any share or concern at all in the choice of the senators. The first institution, in a word, every augmentation, and every supply on vacancies, he supposes to have depended entirely on the will and authority of the kings. Nor does he, like Monsieur Vertot, imagine the reason why Dionysius had reported otherwise, proceeded from his republican spirit, but from what every body who reads him must find in his manner of describing every institution, law, or custom, among the Romans, viz. an affectation of tracing its origin from some similar practice in the Grecian states, in order, from his partiality to that country, to give Greece the honour of having furnished the sketch of every plan, on which the Roman government was framed, and the Roman greatness raised.

Soon after the expulsion of Tarquin, and the establishment of

SENATE.

of the consular government, the senate, which, by many condemnations to death, or exile, the last king had reduced to less than half its complement, was filled up to its former number of three hundred; this supply, according to every historian, was made out of the plebeians; and in all probability, his lordship says, by the sole power of the consuls, since no author relates otherwise, and all authors agree that the consular power at first differed from the regal powers in no particulars but that of being annual, instead of perpetual, and divided between two persons, instead of being vested in a single one.

Till the time of the censors then, lord Hervey tells us, there is not the least reason to imagine, that the people had any hand in promoting any man to the senatorial rank. From the time that the people were allowed to choose the annual magistrates out of their own body, till the time the commonwealth fell into confusion, which ended, as confusion generally does, with a total loss of liberty, the only difficulty in accounting for the filling up of the senate, his lordship says, is to reconcile the right of the annual magistrates to enter the senate, with the power of the censors. And this, he thinks, may be done by distinguishing between a *right to vote in the senate*, and *being a senator*, which were two different privileges, and quite distinct honours. The first was obtained by virtue of exercising any public office, from the quaestorship to the consulship; and was consequently conveyed by the people; whereas the last was a dignity conferrable only by the censors. Festus says, that those who held any public office in the state, and by virtue of that office voted in the senate, were nevertheless no senators till made so by the censors. And Aulus Gellius, in his chapter upon the "*Pedarii Senatores*," says the same thing.

These two classes were always distinguished even in the edict that convoked the senate; the form of the edict, as may be seen in many writers, being *to convene the senators, and all those who had a right to vote in the senate*.

Nor was the difference, according to Aulus Gellius, between the voters in the senate, and the confirmed senators, so unessential, as it may at first appear; for those, who had only a right to vote in the senate, and were not enrolled senators, had no right to speak there, and could only pass in silence to one side or the other, when a division was made on the point in debate. Whereas an enrolled senator had a right, when he gave his vote, to speak as long as he pleased, and on what he thought fit; a privilege, which amounted to a power of stopping all proceedings for that day, and was often so used.

From the story of Fabius Maximus and Crassus, related by Valerius Maximus, book ii. chap. 2. there appears to have been another very essential difference between a senator, and a voter in the senate; for by that story one must imagine that those who were enrolled senators, had not only the sole right of debating any question that came into the senate, but were like a secret committee, or cabinet council, who previously weighed every proposal that was to be made in a general senate, and determined whether it should be brought in or not.

The power of taking cognizance of the manners of every Roman citizen, was first annexed to the censorship, when the office itself was disjoined from that of the consulship, in the three hundred and eleventh year of Rome, as may be seen in Livy, book iv. chap. 8. But the power of choosing the new senators was not transferred from the consuls to the censors till near a hundred years afterwards, in the tribuneship of Ovinus; and it was then given to the censors by the people, to revenge the breach of the Licinian law (which law ordained that one of the consuls should always be chosen

out of the plebeians) for both the consuls being that year patricians, and one of the censors that year, for the first time, being a plebeian, the tribune Ovinus put the people upon this expedient to do themselves justice, and mortify the nobility.

When the annual magistrates were not sufficient to supply the vacancies in the senate, the censors chose whom they pleased. And that the annual magistrates were seldom enough to supply the vacancies, may easily be concluded, when one considers how few they were, and how many vacancies must be made in so large a body as three hundred men, by natural deaths, the change of perpetual war, and the purgations made by the reforming authority of the censors.

The filling up of the senate then from the Olivian tribuneship till the time of the Gracchi, lord Hervey thinks, depended entirely on the censors; for though he allows that the annual magistrates, at the expiration of their office, had a sort of claim and pretension to be put on the roll of senators, by the censors; yet as the censors, under the pretence of reformation, had an uncontrollable power to remove senators already enrolled, so on the same pretence they could, if they pleased, refuse to enrol, and even without giving any reason; since their manner both of expelling or admitting senators was merely by omitting or inserting a name in the ceremony of calling over the roll.

Though the censorship, therefore, at its original institution by Servius Tullius, was nothing more than the office of numbering the people, and taking the valuation of their estates, and an office annexed first to the royal authority, and afterwards to the consular power; yet when it was detached from the consular power, and erected into a separate office, with the power of filling up the senate annexed; from that time, as the cognizance of the manners of every citizen of Rome was also in their department, his lordship looks upon the censors to have been full as absolute in the city and the civil government, with regard to all promotions and degradations, from the senate down to the lowest tribe, curia, or century, as the consuls were in the camp and the military government.

Ever after the time of the Gracchi, the state was either in such confusion, or such absolute slavery, that his lordship thinks there was no regular method at all observed in filling up the senate, or any justice in purging it. Whoever had the sovereign power in his hand, under what title soever he seized or possessed it, modelled the senate by the introduction of new members, or the expulsion of old ones, just as he thought fit.

Dr. Middleton politely acknowledges, that the hypothesis of lord Hervey has the advantage of his own, and will be thought the more solid or plausible by the generality of readers. See Letters between Lord Hervey and Dr. Middleton, concerning the Roman Senate; published by Dr. Knowles, quarto, 1778.

The magistrates who had the power of assembling the senate were the dictator, the consuls, the prætors, the tribunes of the commons, and the interrex. Yet upon extraordinary occasions the same privilege was allowed to the tribuni militum, invested with consular power, and to the decemviri, created for regulating the laws; and to other magistrates chosen upon some unusual occasion.

In the early ages of the republic, when the precincts of the city were small, the senators were personally summoned by an apparitor; and sometimes by a public crier, when their affairs required immediate dispatch; but the usual way of calling them, in later days, was by an edict appointing the time and place, and published several days before,

SENATE.

before, that the notice might be more public. These edicts were commonly understood to reach no farther than to those who were resident in Rome, or near it; yet when any extraordinary affair was in agitation, they seem to have been published also in the other cities of Italy. If any senator refused, or neglected to obey this summons, the consul could oblige him to give surety for the payment of a certain fine, if the reasons of his absence should not be allowed. But from sixty years of age they were not liable to that penalty, nor obliged to any attendance but what was voluntary.

The senate could not regularly be assembled in a private or profane place, but always in one set apart, and solemnly consecrated to that use by the rites of augury.

The senate frequently met in certain *curiæ*. See **CURIÆ**.

But their meetings were more commonly held in certain temples, dedicated to particular deities; as in that of Jupiter, Apollo, Mars, Vulcan, Castor, Bellona; of Concord, Faith, Virtue, the Earth, &c.

These temples, on account of the use which the senate made of them, were called likewise *curiæ*; as well as the proper *curiæ*, or senate-houses, on account of their solemn dedication, are frequently called temples.

On two special occasions the senate was always held without the gates of Rome, either in the temple of Bellona, or of Apollo. 1st. For the reception of foreign ambassadors, and especially of those who came from enemies, who were not permitted to enter the city. 2dly. To give audience, and transact business with their own generals, who were never allowed to come within the walls as long as their commission subsisted, and they had the actual command of an army.

The senate met always, of course, on the 1st of January, for the inauguration of the new consuls, who entered into their office on that day.

The month of February, generally speaking, was reserved entire by old custom to the senate, for the particular purposes of giving audience to foreign ambassadors.

In all months, universally, there were three days, which seem to have been more especially destined to the senate, the kalends, nones, and ides, from the frequent examples found in history, of its being convened on those days. But Augustus enacted afterwards, that the senate should not meet regularly, or of course, except on two days only of each month, the kalends, and ides.

On their days of meeting, they could not enter upon any business before the sun was risen, nor finish any after it was set; every thing transacted by them, before or after that time, was null and void, and the author of it liable to censure. Whence it became a standing rule, that nothing new should be moved after four o'clock in the afternoon. The senate, as has been shewn above, was composed of all the principal magistrates of the city, and of all who had borne the same offices before them: and consisted therefore of several degrees and orders of men, who had each a different rank in it, according to the dignity of the character which he sustained in the republic. At the head of the senate sat the dictator and consuls, in chairs of state. Manutius thinks that the other magistrates sat next to the consular chair, each according to his rank; the prætors, censors, ædiles, tribunes, quaestors. But Dr. Middleton rather thinks that the consular senators, who, in all ages of the republic, were the leaders and first speakers in the senate, used to sit next in order to the consuls; and after them the prætors, and all who were of prætorian dignity, or had been prætors; then the ædiles, the tribunes, and the

quaestors, on distinct benches; and on the same bench with each, all who had borne the same offices; but the curule magistrates, as the prætors and ædiles, were perhaps distinguished, at the head of their several benches, by seats somewhat raised, or separated at least from the rest, in the form of our settees, or of that *longa cathedra*, which Juvenal mentions, to denote the curule dignity.

All the private senators sat on different benches, and in a different order of precedency, according to the dignity of the magistracies which they had severally borne. First the consular, then the prætorians, ædilitians, tribunitians, and quaestorians; in which order, and by which titles, they are all enumerated by Cicero. And as this was their order in sitting, so it was the same also in delivering their opinions when it came to their turn. Cic. Phil. 13, 14.

The senate being assembled, the consuls, or the magistrate, by whose authority they were summoned, having first taken the auspices, and performed the usual office of religion, by sacrifice and prayer, used to open to them the reasons of their being called together, and propose the subject of that day's deliberation; in which all things divine, or relating to the worship of the gods, were dispatched preferably to any other business. When the consul had moved any point, with intent to have it debated and carried into a decree, and had spoken upon it himself as long as he thought proper, he proceeded to ask the opinions of the other senators, severally in their name, and in their proper order, beginning always with the consulars, and going on to the prætorians, &c. It was the practice originally to ask the prince of the senate the first; but that was soon laid aside, and the compliment transferred to any other ancient consular, distinguished by his integrity and superior abilities; till, in the later ages of the republic, it became an established custom to pay that respect to relations, or particular friends, or to those who were likely to give an opinion the most favourable to their own views and sentiments on the question proposed. But whatever order the consuls observed in asking opinions on the 1st of January, when they entered into their office, they generally pursued the same through the rest of the year. Julius Cæsar, indeed, broke through this rule; for though he had asked Crassus the first, from the beginning of his consulship; yet, upon the marriage of his daughter with Pompey, he gave that priority to his son-in-law, for which, however, he made an apology to the senate.

This honour of being asked in an extraordinary manner, and preferably to all others of the same rank, though of superior age or nobility, seems to have been seldom carried farther than to four or five distinguished persons of consular dignity; and the rest were afterwards asked according to their seniority. And this method, as has been said, was observed generally throughout the year, till the election of the future consuls, which was commonly held about the month of August; from which time, it was the constant custom to ask the opinions of the consuls elect, preferably to all others, till they entered into their office, on the 1st day of January following.

As the consuls elect had this preference given in speaking before all the consulars, so the prætors, and tribunes elect, seem to have had the same, before the rest of their particular orders.

None were allowed to speak till it came to their turn, excepting the magistrates, who seem to have had a right of speaking on all occasions, whenever they thought fit; and for that reason, perhaps, were not particularly asked, or called upon by the consuls.

If in the debate several different opinions had been offered, and each supported by a number of senators, the consul,

consul, in the close of it, used to recite them all, that the senate might pass a vote separately upon each; but in this he gave what preference he thought fit to that opinion which he most favoured, and sometimes even suppressed such of them as he wholly disapproved.

In cases, however, where there appeared to be no difficulty or opposition, decrees were sometimes made, without any opinion being asked or delivered upon them.

When any question was put to the vote, it was determined always by a division, or separation of the opposite parties, to the different parts of the senate-house; the consul, or presiding magistrate, having first given order for it in this form: *Let those, who are of such an opinion, pass over to that side; those, who think differently, to this.*

What the majority of them approved, was drawn up into a decree, or *senatus-consultum*, which was generally conceived in words prepared and dictated by the first mover of the question, or the principal speaker in favour of it; who, after he had spoken what he thought sufficient to recommend it to the senate, used to conclude his speech by summing up his opinion in the form of such a decree as he desired to obtain. Which decree, when confirmed by the senate, was always signed and attested by a number of senators, who chose to attend through the whole process of it, for the sake of adding their names to it, as a testimony of their particular approbation of the thing, as well as of respect to the person, by whose authority, or in whose favour it was drawn.

When the senate appeared to be disposed and ready to pass a decree, it was in the power of any one of the ten tribunes of the people to intercede, that is, to over-rule it. See INTERCESSION.

In all cases, where the determinations of the senate were over-ruled by the negative of a tribune, of which there are numberless instances, if the senate was unanimous, or generally inclined to the decree so inhibited, they usually passed a vote to the same purpose, and in the same words, which was called *senatus auctoritas*, an authority or judgment of the senate, and was entered into their journals. But this had no other force than to testify the judgment of the senate on that particular question, and to throw the odium of obstructing an useful act on the tribune who hindered it.

In order to deter any magistrate from acting factiously and arbitrarily in affairs of importance, they often made it part of the decree, which they were going to enact, that if any one attempted to obstruct it, he should be deemed to act against the interest of the republic. Yet this clause had seldom any effect on the hardy tribunes, who used to apply their negative in defiance of it as freely as on any other indifferent occasion.

The factions, and leaders of parties, had several arts of obstructing, or postponing a decree, by many pretexts and impediments which they could throw in its way. Sometimes they alleged scruples of religion, that the auspices were not favourable, or not rightly taken; which, if confirmed by the augurs, put a stop to the business for that day. At other times, they urged some pretended admonition from the Sibylline books, which were then to be consulted and interpreted to a sense that served their purpose. But the most common method was to waste the day, by speaking for two or three hours successively, so as to leave no time to finish the affair at that meeting: yet when some of the more turbulent magistrates were grossly abusing this right, against the general inclination of the assembly, the senators were sometimes so impatient as to silence them, as it were, by force, and to disturb them in such a manner, by their clamour and hissing, as to oblige them to desist.

The decrees of the senate were usually published, and openly read to the people soon after they were passed; and an authentic copy of them was always deposited in the public treasury of the city, or otherwise they were not considered as legal or valid.

As to the force of these decrees, it is difficult to define precisely what it was. It is certain that they were not considered as laws, but seem to have been designed originally as the ground-work, or preparatory step to a law, with a sort of provisional force, till a law of the same tenor should be enacted in form by the people; for in all ages of the republic, no law was ever made, but by the general suffrage of the people.

Even under the kings, the collective body of the people was the real sovereign of Rome, and the dernier resort in all cases. But their power, though supreme and final, was yet qualified by this check, that they could not regularly enact any thing, which had not been previously considered and approved of by the senate. This indeed continued to be the general way of proceeding in all quiet and regular times, from the beginning of the republic to the end of it; and the constant style of the old writers, in their accounts of the public transactions, is, that the senate voted or decreed, and the people commanded such and such an act. Middleton, *ubi supra*, and the authorities cited by him.

Before the accession of Augustus the senate had lost its power, and also its dignity. Many of the most noble families were extinct; the republicans of spirit and ability had perished in the field of battle, or in the proscription. The door of the assembly had been designedly left open for a mixed multitude of more than a thousand persons, who reflected disgrace upon their rank, instead of deriving honour from it. Julius Cæsar introduced soldiers, strangers, and half-barbarians into the senate; and this abuse, recorded by Suetonius, became still more scandalous after his death. Augustus, soon after his accession, set about the reformation of it. He was elected censor: and in concurrence with his faithful Agrippa, he examined the list of the senate, expelled a few members whose vices or whose obliquity required a public example; persuaded near two hundred to prevent the shame of an expulsion by a voluntary retreat; raised the qualification of a senator to above ten thousand pounds; created a sufficient number of patrician families; and accepted for himself the honourable title of prince of the senate, which had always been bestowed, by the censors, on the citizen most eminent for his honours and services. But in thus restoring the dignity, he destroyed the independence of the senate, the principles of a free constitution being irrecoverably lost, when the legislative power is nominated by the executive. How he was afterwards recompensed by the flattery of the senate is well known. (See AUGUSTUS, PROCONSUL, and IMPERATOR.) It was, however, on the dignity of the senate, that Augustus and his successors founded their new empire; and in the administration of their own powers, they frequently consulted the great national council, and seemed to refer to its decision the most important concerns of peace and war. Rome, Italy, and the internal provinces, were subject to the immediate jurisdiction of the senate. With regard to civil objects, it was the supreme court of appeal; with regard to criminal matters, a tribunal, constituted for the trial of all offences that were committed by men in any public station, or that affected the peace and majesty of the Roman people. The exercise of the judicial power became the most frequent and serious occupation of the senate; and the important causes that were pleaded before them afforded a last refuge to the spirit of ancient eloquence. As a council of state, and as a court of justice, the senate pos-

possessed very considerable prerogatives ; but in its legislative capacity, in which it was supposed virtually to represent the people, the rights of sovereignty were acknowledged to reside in that assembly. Every power was derived from their authority ; every law was ratified by their sanction. Their regular meetings were held, as we have already said, on three stated days in every month ; their debates were conducted with decent freedom ; and the emperors themselves, who gloried in the name of senators, sat, voted, and divided with their equals.

Augustus found by experience, what he had previously expected, that the senate and people would submit to slavery, provided they were respectfully assured, that they still enjoyed their ancient freedom ; a feeble senate and an enervated people cheerfully acquiesced in the pleasing illusion, as long as it was supported by the virtue, or even by the prudence of the successors of Augustus. It was a motive of self-preservation, not a principle of liberty, that animated the conspirators against Caligula, Nero, and Domitian. After seventy years of patience, the senate made an ineffectual attempt to reassume its long-forgotten rights. When the throne was vacated by the murder of Caligula, the consuls convoked the assembly in the Capitol, and during forty-eight hours acted as the independent chiefs of the commonwealth. But while they deliberated, the prætorian guards had resolved : the dream of liberty was at an end ; and the senate awoke to all the horrors of inevitable servitude. Deserted by the people, and threatened by a military force, that feeble assembly was compelled to ratify the choice of the prætorians, and to embrace the benefit of an amnesty, which Claudius had the prudence to offer, and the generosity to observe. To censure, to depose, or to punish with death the first magistrate of the republic, who had abused his delegated trust, was the eminent and undoubted prerogative of the Roman senate ; accordingly they condemned Nero to be put to death, as Suetonius observes, *more majorum* ; but on the death of Commodus, that feeble assembly was obliged to content itself with inflicting on a fallen tyrant that public justice from which, during his life and reign, he had been shielded by the strong arm of military despotism. Till the reign of Severus, the virtue and even the good sense of the emperors, had been distinguished by their real or affected reverence for the senate, and by a tender regard to the nice frame of civil policy instituted by Augustus. But Severus, trained from his youth to the despotism of military command, disdained to profess himself the servant of an assembly that detested his person, and trembled at his power : he assumed the conduct and style of a sovereign and a conqueror, and exercised, without disguise, the whole legislative as well as executive power. Hence the senate, neither elected by the people, nor guarded by military force, nor animated by public spirit, rested its declining authority on the frail and crumbling basis of ancient opinion. The fine theory of a republic insensibly vanished, and made way for the more natural and substantial feelings of monarchy. The polished and eloquent slaves from the eastern provinces, by whom the senate was filled, justified personal flattery by speculative principles of servitude. The lawyers and the historians concurred in teaching, that the imperial authority was held, not by the delegated commission, but by the irrevocable resignation of the senate ; that the emperor was freed from the restraint of civil laws, could command by his arbitrary will the lives and fortunes of his subjects, and might dispose of the empire as of his private patrimony. Posterity, who experienced the fatal effects of the maxims and example of Severus, justly considered him as the principal author of the decline of the Roman empire. Such was the timid ingratitude of Gallienus,

that, unmindful of his obligations to the senate and people for repulsing the Alemanni from Rome, he published an edict, prohibiting the senators from exercising any military employ ; and even from approaching the camps of the legions. Tacitus was chosen emperor by the senate, and the judgment of this assembly was confirmed by the consent of the Roman people, and of the prætorian guards. By this election the senate regained several important prerogatives, the principal of which were the following : 1. To invest one of their body, under the title of emperor, with the general command of the armies and the government of the frontier provinces. 2. To determine the list, or as it was then styled, the college of consuls. 3. To appoint the proconsuls and presidents of the provinces, and to confer on all the magistrates their civil jurisdiction. 4. To receive appeals through the immediate office of the prefect of the city from all the tribunals of the emperor. 5. To give force and validity by their decrees to such as they should approve of the emperor's edicts. 6. To those several branches of authority, we may add some inspection of the finances, since even in the stern reign of Aurelian, it was in their power to divert a part of the revenue from the public service. Diocletian expressed his dislike of Rome and Roman freedom, by framing a new system of imperial government, which was afterwards completed by the family of Constantine ; and as the image of the old constitution was religiously preserved in the senate, he resolved to deprive that order of its small remains of power and consideration. The name of the senate was mentioned with honour till the last period of the empire ; the vanity of its members was still flattered with honorary distinctions ; and the assembly which had been so long the source, and so long the instrument of power, was respectfully suffered to fall into oblivion. The senate of Rome losing all connection with the imperial court and the actual constitution, was left a venerable but useless monument of antiquity on the Capitoline hill. During the Gothic war, and in consequence of the conquest of Rome by Narjes, the institution of Romulus, after a period of thirteen centuries, expired ; and if the nobles of Rome still assumed the title of senators, few subsequent traces can be discovered of a public council, or constitutional order. Ascend six hundred years, and contemplate the kings of the earth soliciting an audience, as the slaves or freedmen of the Roman senate. From the year 1144 the senate was restored, and its establishment is dated as a glorious era in the acts of the city. After its revival, the conscript fathers, if the expression may be used, were invested with the legislative and executive power ; but their views seldom reached beyond the present day, and that day was most frequently disturbed by violence and tumult. In its utmost plenitude, the order or assembly consisted of fifty-six senators, the most eminent of whom were distinguished by the title of counsellors : they were nominated, perhaps annually, by the people ; and a previous choice of their electors, ten persons in each region or parish, might afford a basis for a free and permanent constitution. The popes confirmed by treaty the establishment and privileges of the senate, and expected from time, peace, and religion, the restoration of their government. The motives of public and private interest might sometimes draw from the Romans an occasional and temporary sacrifice of their claims ; and they renewed their oaths of allegiance to the successors of St. Peter and Constantine, the lawful head of the church and republic. At length the union and vigour of a public council were dissolved in a lawless city ; and the Roman see adopted a more strong and simple mode of administration. They condensed the name and authority of the senate in a single magistrate, or two colleagues ; and as they were changed at the end of,

a year,

a year, or six months, the greatness of the senate was compensated by the shortness of the term. The senators of Rome indulged their avarice and ambition; their justice was perverted by the interest of their family and faction; and as they punished only their enemies, they were obeyed only by their adherents. In this state of anarchy, most of the Italian republics chose, in some foreign but friendly city, an impartial magistrate of noble birth and unblemished character, a soldier and a statesman, recommended by the voice of fame and his country, to whom they delegated for a time the supreme administration of peace and war. See Gibbon's Hist. of the Decline and Fall of the Roman Empire.

SENATE of four hundred, an ancient senate of Athens, when the city was divided into four tribes, each of which chose a hundred men. This lasted till Solon instituted the senate of five hundred, after the city was divided into five tribes.

SENATE of Venice. See PREGADI.

SENATOR, a member of a senate.

There were two orders, or degrees, among the Roman nobility: that of the *senators*, and that of the *knights*; after these two, came the people. The first hundred senators were appointed by Romulus, and called *patres, fathers*. Upon the union with the Sabines, Romulus, or as others say, Tullus, added a second hundred, called *patres majorum gentium*: this distinguished them from a third hundred, added by the elder Tarquin, and called *patres minorum gentium, fathers of the lower rank*.

In ancient Rome, the number of senators is commonly supposed to have been limited to three hundred, from the time of the kings to that of the Gracchi. But this must not be taken too strictly. The senate generally had that number, or thereabout, and upon any remarkable deficiency, was filled up again to that complement by an extraordinary creation. But as the number of the public magistrates increased with the increase of their conquests and dominions, so the number of the senate, which was supplied of course by those magistrates, must be liable also to some variation. To what number Sylla increased them is not absolutely certain; but in Cicero's time they were not less than four hundred and fifteen, as appears by his letter to Atticus, lib. i. ep. 14.

In the time of Gracchus they were six hundred; during the civil wars they were reduced to three hundred. Julius Cæsar augmented that number to nine hundred; the triumvirs to above a thousand: and Augustus reduced them to six hundred, according to Dion Cassius; and to three hundred, according to Suetonius. For the choice of senators belonged at first to the kings, then to the consuls, then to the censors, who in their census or survey every fifth year, appointed new senators in lieu of those dead or degraded; but at length it fell to the emperors. See SENATE.

Though, for a long time, none were raised to the dignity of senators, but those most conspicuous for their prudence, &c. yet some regard was afterwards had to their estate, lest their dignity should become debased by poverty. To hold the senatorial dignity, a yearly revenue of eight hundred thousand sesterces was required, which amounts to between six and seven thousand pounds of our money. Half as much was required for the qualification of the knights. The senators who sunk below this revenue, were discarded, and expunged out of the list by the censor; and this was increased by Augustus to twelve hundred thousand.

This qualification must not be taken, as it is by some, for an annual income, but the whole estate of a senator, real and personal, as estimated by the survey and valuation of the censors.

This proportion of wealth may seem perhaps too low,

and unequal to the high rank and dignity of a Roman senator, but it must be considered only as the lowest to which they could be reduced; for whenever they sunk below it, they forfeited their seats in the senate.

In ancient Rome, a certain age was required for a senator, as is often intimated by the old writers, though none of them have expressly signified what it was. The legal age for entering into the military service was settled, by Servius Tullius, at seventeen years; and they were obliged, as Polybius tells us, to serve ten years in the wars, before they could pretend to any civil magistracy. This fixes the proper age of suing for the quaestorship, or the first step of honour, to the twenty-eighth year; and as this office gave an admission into the senate, so the generality of the learned seem to have given the same date to the senatorial age. Some writers, indeed, on the authority of Dion Cassius, have imagined it to be twenty-five years, not reflecting that Dion mentions it there as a regulation only proposed to Augustus by his favourite Mæcenæ. Dr. Middleton takes the quaestorian age, which was the same with the senatorian, to have been thirty years complete.

The laws concerning the age of magistrates were not very ancient: and were made to check the forward ambition of the nobles, and to put all the citizens upon a level in the pursuit of honours. And Livy tells us, that L. Villius, a tribune of the people, was the first who introduced them, A.U. 573, and acquired by it the surname of Annalis. Middlet. of Rom. Sen. p. 99.

The senators were ordinarily chosen from among the knights, or from among such as had borne the principal offices. At first the magistrates were taken wholly from among the senators; whence Tacitus calls the senate the *seminary of all dignities*: but after the people had been admitted to magistratures, senators were taken from among such as had discharged those offices, though before plebeians.

There was some law subsisting from the earliest times, concerning the extraction and descent of senators, enjoining that it should always be ingenuous; and as their morals were to be clear from all vice, so their birth likewise from any stain of base blood. In consequence of which, when Appius Claudius, in his censorship, attempted to introduce the grandsons of freed slaves into the senate, they were all immediately turned out again.

These are some of the laws by which the censors were obliged to act, in the enrolment of the new, or the omission of old senators; and when we read of any left out, without any intimation of their crime, it might probably be for the want of one or other of these legal, or customary qualifications.

It was from the senatorian order alone, that all ambassadors were chosen and sent to foreign states; and when they had occasion to travel abroad, even on their private affairs, they usually obtained from the senate the privilege of a free legation, as it was called; which gave them a right to be treated every where with the honours of an ambassador, and to be furnished on the road with a certain proportion of provisions and necessaries, for themselves and their attendants; and as long as they resided in the Roman provinces, the governors used to assign them a number of lictors, or macebearers, to march before them in state, as before the magistrates in Rome. And if they had any law-suit, or cause of property depending in those provinces, they seem to have had a right to require it to be remitted to Rome.

At home, likewise, they were distinguished by peculiar honours and privileges; for at the public shows and plays they had particular seats set apart, and appropriated to them

in the most commodious part of the theatre; and on all solemn festivals, when sacrifices were offered to Jupiter by the magistrates, they had the sole right of feasting publicly in the Capitol, in habits of ceremony, or such as were proper to the offices which they had borne in the city.

The peculiar ornament of the senatorian tunic was the *latus clavus* (see *LATICLAIVIUM*), as it was called, being a broad stripe of purple sewed upon the fore part of it, and running down the middle of the breast, which was the proper distinction between them and the knights, who wore a much narrower stripe of the same colour, and in the same manner. The fashion also of their shoes was peculiar, and different from that of the rest of the city; this difference appeared in the colour, shape, and ornament of the shoes. The colour of them was black, while others wore them of any colour perhaps, agreeable to their several fancies; the form of them was somewhat like to a short boot, reaching up to the middle of the leg, as they are sometimes seen in ancient statues and bas-reliefs; and the proper ornament of them was a half moon sewed, or fastened upon the fore-part of them, near the ankle.

Consuls, prætors, ædiles, tribunes, &c. during the year of their magistracy, always wore the prætexta, or a gown bordered round with a stripe of purple. In which habit also, as has been signified above, all the rest of the senate, who had already borne those offices, used to assist at the public festivals and solemnities.

The senators carried their children with them to the senate, to inform them betimes of affairs of state; though these children had not admittance till seventeen years of age. Some make a distinction among the senators, and say, that besides the senators who were allowed to speak, and were asked their opinions, there were others, who, without speaking, or being ever asked their judgment; were only to follow the opinion of those they thought the most reasonable, and were hence called *pedarii*. A. Gellius gives us another notion of the *pedarii*, and says, those were thus called, who, having never borne the office of curule magistrate, were obliged to go to the senate on foot.

They had the name senators, q. d. *old men*, given them in imitation of the Greeks, who called their senate *γεγενηα*. So when the Athenians assembled the people to consult about the affairs of the public, the officers summoned none but such as were at least fifty years old.

The Egyptians and Persians followed the same example, after the Hebrews; and the Lacedæmonians and Carthaginians received none but such as were sixty years of age. See *CONSCRIPT*.

As to other matters relating to Roman senators, see the article *SENATE*, supra.

SENATUS AUCTORITAS. See *SENATE*.

SENATUS-CONSULTUM, a vote, or resolution, of the Roman senate, pronounced on some question, or point of law, proposed to it. See *SENATE*.

The *senatus-consulta* made a part of the Roman law: when passed, they were deposited in the temple of Ceres, under the custody of the ædiles; and at last they were carried, by the censor, to the temple of Liberty, and put up in an armory called *tabularia*.

Julius Capitolinus speaks of a sort of *senatus-consulta tacita*, which, he says, were made in reference to affairs of great moment and secrecy by the senators themselves, without the privacy of the public officers, under an oath of secrecy, till their designs should be effected.

The narrative of the famous *senatus-consultum*, or rather decree, against the musician Timotheus, at Sparta, for

augmenting the number of strings on his lyre, is confirmed by Pausanias and Suidas.

This curious piece of antiquity is preserved at full length by Boethius (*De Musica*, cap. 1.) Mr. Stillingfleet (*Prin. and Power of Harm.* § 185.) has given an extract from it, in proof of the simplicity of the ancient Spartan music. The fact is mentioned in Athenæus; and Casaubon, in his notes on that author (*Animad.* in *Athen.* p. 386.), has inserted the whole original text from Boethius, with corrections, to which we refer the learned reader. We shall here, however, give a faithful translation of this extraordinary Spartan *Act of Parliament*.

"Whereas Timotheus the Milesian, coming to our city, has dishonoured our ancient music, and, despising the lyre of seven strings, has, by the introduction of a greater variety of notes, corrupted the ears of our youth; and by the number of his strings, and the novelty of his melody, has given to our music an effeminate and artificial dress, instead of the plain and orderly one in which it has hitherto appeared; rendering melody infamous, by composing in the chromatic, instead of the enharmonic;—The kings and the ephori have, therefore, resolved to pass censure upon Timotheus for these things: and, farther, to oblige him to cut all the superfluous strings of his *eleven*, leaving only the *seven* tones; and to banish him from our city, that men may be warned for the future, not to introduce into Sparta any unbecoming customs."

The same story, as related in Athenæus, has this additional circumstance, that when the public executioner was on the point of fulfilling the sentence, by cutting off the new strings, Timotheus, perceiving a little statue in the same place, with a lyre in his hand, of as many strings as that which had given the offence, and shewing it to the judges, was acquitted.

Indeed the decree only informs us, that the use of a lyre, with more than seven strings, was not allowed at this time by the Lacedæmonians; but does not prove that the rest of Greece had confined their music within the compass of *seven* notes: nor, consequently, ascertain how many of the *eleven* strings were additions *peculiar* to Timotheus. That the outcry against the novelties of this musician was, however, not confined to Sparta, appears from a passage in Plutarch's Dialogue, where he gives a list of the innovators who had corrupted and enervated the good old melody, by additional notes both upon the flute and lyre.

"Lasus of Hermione," says he, "by changing musical rhythms to the dithyrambic irregularity of movement, and, at the same time, emulating the compass and variety of the flute, occasioned a great revolution in the ancient music. Melanippides, who succeeded him, in like manner, would not confine himself to the old music, any more than his scholar Philoxenus, or Timotheus."

The same thing also appears from the bitter invectives to which the comic poets at Athens, especially Pherecrates and Aristophanes, gave a loose; not, perhaps, from understanding music, or being at all sensible of its effects, but from that envy which the great reputation of the musician had excited. An exalted character is a shooting butt, at which satirists, and wicked wits, constantly point their arrows; and the stage at all times wages war against whatever calls off the public attention from itself.

The abuse, therefore, of this musician, which abounds in ancient authors, is, perhaps, as great a proof of his superiority as the praise. A Greek epigram, preserved in Macrobius, informs us, that the Ephesians gave him a thousand pieces of gold for composing a poem in honour of Diana, at the dedication of the temple of that goddess; and

and was not that a sufficient reason for hungry authors to rail?

Plutarch tells us, that the comic poet Pherecrates introduced Music on the stage, under the figure of a woman, whose body was terribly torn and mangled. She is asked by Justice, under the figure of another woman, the cause of her ill-treatment? when she relates her story in the following words: "The first source of all my misfortunes was Melanippides, who began to enervate and debilitate me by his *twelve strings*. However, this would not have reduced me to the deplorable condition in which I now appear, if Cinesias, that cursed Athenian, had not contributed to ruin and disfigure me in his dithyrambic strophes, by his false and untuneable inflexions of voice. In short, his cruelty to me was beyond all description; and next to him, Phrynus took it into his head to abuse me by such divisions and flourishes, as no one ever thought of before, making me subservient to all his whims, twisting and twirling me a thousand ways, in order to produce from *five strings*, the *twelve* different *modes*. But still, the freaks of such a man would not have been sufficient to complete my ruin, for he was able to make me some amends. Nothing now was wanting but the cruelty of one Timotheus to send me to the grave, after maiming and mangling me in the most inhuman manner." "Who is this Timotheus?" says Justice.

MUSIC.

"O 'tis that vile Milesian blade,
Who treats me like an arrant jade:
Robs me of all my former fame;
And loads me with contempt and shame:
Contriving skill, where'er he goes,
New ways to multiply my woes:
Nay more, the wretch I never meet,
Be it in palace, house, or street,
But straight he tries to clip my wings,
And ties me with a dozen strings."

SENAURA, in *Geography*, a town of Hindoostan, in the circar of Bickaneer; 5 miles E. of Jesselmere.

SENCE, a river of England, which rises in Leicestershire, and runs into the Anker, near Atherstone, in Warwickshire.

SEND, is used by seamen, when a ship, either at an anchor, or under sail, falls with her head, or stern, deep into the trough of the sea, *i. e.* into a hollow made between two waves, or billows. They say she *sends* much that way, whether it be a-head or a-stern.

SENDAL, in our *Old Writers*, a kind of thin fine silk, mentioned in the stat. 2 Rich. II. cap. 1.

SENDEBAS, in *Geography*, a town of Egypt, on the east branch of the Nile; 13 miles S. of Semmenud.

SENDELBACH, LANGEN, a town of Germany, in the bishopric of Bamberg; 5 miles S.S.E. of Forcheim.

SENDEN, a town of Germany, in the bishopric of Munster; 7 miles S.S.W. of Munster.

SENDENHORST, a town of Germany, in the bishopric of Munster; 10 miles S.S.E. of Paderborn.

SENDESE, a town of Egypt, on the Kalits il Menhi; 3 miles N. of Behnese.

SENDEGEAN, a town of Asiatic Turkey, in Natolia; 13 miles S.E. of Balikesri.

SENDGISCHOW, a town of Poland, in the palatinate of Sandomirz; 36 miles S.S.W. of Sandomirz.

SENDI, or SINDI, in *Ancient Geography*, a people of Scythia, in the country called Sendica, in the vicinity of the country of the Tauro-Scythians. Pliny.

SENDIA, in *Geography*, a town of New Mexico, on the Bravo; 50 miles S. of Santa Fé.

SENDUARY, a town of Hindoostan, in Bahar; 45 miles S.S.W. of Patna.

SENEBIERA, in *Botany*, a genus of Decandolle's, dedicated to Mr. John Senebier, a Genevan naturalist, who published a work upon Vegetable Physiology, in 1791. Decand. Mem. de la Soc. d'Histoire Naturelle, 142. De Theis, 427.

SENECA, LUCIUS ANNÆUS, in *Biography*, a celebrated philosopher, was born at Corduba, near the commencement of the Christian era. His father was a man of equestrian rank, and an eminent orator, of whom some declamations and controversies are extant. His mother was Helvia, a Spanish lady of distinction. Being educated at Rome, he was early initiated in the study of eloquence by his father, and other masters; but his own propensity led him to devote his talents to the study of philosophy. He first joined the Pythagoreans, whom he soon left for the Stoics; he, however, confined himself to no sect, but extended his inquiries to all the systems of Grecian philosophy. In conformity to the wishes of his father, he pleaded some time in the courts of justice, and acquired by the practice a considerable reputation; but it is thought he relinquished the bar, through fear of the jealousy of Caligula, who was ambitious of oratorical fame. Entering into public life, he obtained the office of questor, and had risen to some consequence in the court of Claudius, when, at the instigation of Messalina, he was accused of an adulterous commerce with Julia, the daughter of Germanicus, and was banished to the island of Corsica. In that island he remained in exile eight years, consoling himself with the maxims of philosophy, though never resigned to the severity of his lot, as may be inferred from his complaints, and his abject application to the emperor for pardon.

Upon the marriage of Claudius to his second wife Agrippina, Seneca was, through her influence, recalled, and, after being raised to the prætorship, was appointed preceptor to her son, the afterwards most infamous Nero; while Burrhus was made his governor and military instructor. They are said to have acted with the most perfect unanimity in restraining him from those vices, to which his situation and inclination prompted him; and obtained an ascendancy over him, to which is attributed the flattering promise of the first years of his reign.

When Nero began to display his real character, his quarrels with his mother, who was as violent and wicked as her son, laid his governors under great difficulties. Once they were the means of reconciling them, but at length the breach was irreparable, and Nero determined to free himself from one whom he regarded as a dangerous competitor, by the horrid crime of matricide. Seneca and Burrhus were apprised of his intention, and did not oppose it, as they ought to have done; and after the deed was perpetrated, Seneca wrote to the senate, in the name of the emperor, to justify it. Burrhus died very soon, and the influence of Seneca over his pupil was entirely lost; nevertheless the tyrant heaped upon his preceptor unbounded wealth, which not only exposed the character of the philosopher to severe censure, but was in the end the principal cause of his destruction. Finding that he was an object of envy to the favourites of the prince, he requested permission to retire from court, and refund all that he had received from the imperial liberality. Nero assured him of his continued regard, and would not hear of the proffered restitution of rewards, which he had so well merited. Seneca, however, knew him too well to place any confidence in his declarations,

tions, and kept himself out of fight as much as possible. Notwithstanding his prudence, it is said that the tyrant engaged one of his freedmen to poison him, and that Seneca by good fortune escaped the snare. It was not long, however, before an occasion was given to the emperor to gratify his hatred against one, whom he felt as a secret censor of his vices. Under the pretence of Seneca's connection with a conspiracy, a military tribune was sent with a band of soldiers to Seneca's house, where he was at supper with his wife Paulina, and two friends. He was, without much ceremony, commanded to put an end to himself. The philosopher heard the sentence with equanimity, and only asked for time sufficient to make his will. This was refused, and turning to his friends, he said, that since he was not allowed to shew his gratitude to them in any other way, he would leave them the image of his life, as the best memorial of their friendship. He then exhorted them to moderate their grief. He embraced Paulina, and endeavoured to comfort her; but she refused any other consolation than that of dying with him. The death which he chose was that by opening his veins, and he expired in the year 65, and in the 12th year of Nero's reign. The emperor would not suffer Paulina to die with her husband; but she never recovered the loss of blood which she had experienced, before the imperial decree arrived.

The character of Nero has been greatly extolled by some writers, and not less deprecated by others; but Tacitus, without pretending to conceal his faults, inclines to a favourable opinion of him; and it is completely ascertained, that while Nero followed the precepts of his master, he appeared a good prince; and that all virtue was banished from the court, when Seneca left it.

"If," says one of the philosopher's biographers, "a writer could be estimated by his works, a purer moralist could not easily be found; for their constant tenor is that of solid virtue, tempered with humanity, and exalted by the noblest principles of theism. They are indeed marked with the tumid pride inculcated by the Stoical sect, to which he chiefly adhered, though he freely adopted what he found good in others." Of his writings which have come down to us, the greater part are moral, consisting of epistles, 124 in number, and of distinct treatises on Anger, Consolation, Providence, &c. There are, moreover, seven books on physical topics, entitled "Natural Questions," in which are to be found the rudiments of some notions regarded as fundamental in modern physics.

A number of tragedies are extant, under the name of Seneca, but they are probably not his; nor is it at all known to whom they ought to be ascribed. The editions of Seneca's works are very numerous. Of the works, not including the tragedies, the most esteemed are those of Lipsius; the Variorum, 3 vols. 8vo.; the Leipzig, 2 vols. 8vo.; and the Bipontine. Of the tragedies, are the Variorum; that by Heinsius, with notes by Scaliger; and the quarto Delphin.

SENECA, in *Geography*, a town of America, in the county of Onondago, in New York, laid out in streets and squares, on the north side of Seneca Falls. The inhabitants have erected, at a great expence, flour and saw-mills, of the best kind in this place, and also a bridge across Seneca river; and as the place is central, and accessible from the eastern and western countries, it promises a rapid increase.

SENECA Creek, a creek in Maryland, which has two branches; one called Little Seneca. It empties into Potomac river, about 19 miles N.W. of the mouth of Rock creek, which separates George-town from Washington city.

SENECA Lake, a lake in Ontario county, New York, which is a handsome piece of water, from 35 to 40 miles in length, and about 2 miles wide. At the N.W. corner of the lake stands the town of Geneva; and on the E. side, between it and Cayuga, are the towns of Romulus, Ovid, Hector, and Ulysses, in Onondago county, New York. Its outlet is Scayage river, which also receives the waters of Cayuga lake, 9 miles N.E. from the mouth of Canada Sag, 18 miles below Geneva.

SENECA River, a river in the state of New York, which has an easterly course, and receives the waters of Seneca and Cayuga lakes, which lie north and south, 10 or 12 miles apart, and empties into the Onondago river, 14 miles below the Falls, at a place called the Three Rivers. The river is boatable from the lakes downwards. Within half a mile of the river is the famous salt lake.

SENECAI, or SENEÇE, ANTOINE BAUDERON DE, in *Biography*, a French poet, was born at Maçon in 1543. He was brought up to the bar, and pleaded for a time, rather in compliance with his father's wishes, than from his own inclination. A duel, in which he was engaged, obliged him to retire to the court of Savoy, where he had another quarrel with the brothers of a lady, who attached herself to him; and the consequences of which caused him to withdraw to Madrid. After this he returned to France, married, and purchased the place of first valet-de-chambre to Theresa, the wife of Lewis XIV. Losing that office, on the death of the queen, he, with his family, was received into the house of the duchess of Angouleme, where for 30 years he enjoyed an honourable retreat. At her death, he fixed his residence at his native town, where he died in 1737, having attained to his 94th year. Senece devoted himself to literature, and many of his compositions were inserted in the "Mercures," and other periodical works of the time. By his poems he has obtained a rank among the successful votaries of the French muses. Voltaire denominated him "a poet of a singular imagination," and says, that his tale of "Kaimac" is a distinguished performance. He also speaks in praise of his "Travaux d'Apollon." His tale, entitled "La Manière de Filer le parfait Amour," is much esteemed. He was also the author of "Remarques Historiques," with observations on the Memoirs of Cardinal de Retz.

SENECAS, or SENEKAS, in *Geography*, a tribe of Indians, being one of the Six nations. They inhabit the territory on Genesee river, at the Genesee castle. This tribe consists of about 1780 persons. They have two towns of 60 or 70 inhabitants each, on French creek, in Pennsylvania; and another town on Buffalo creek, which falls into the eastern extremity of lake Erie, on the New York shore; and two small towns on Alleghany river. The Seneca Indians are wonderfully expert in the use of bows and blow-guns, with which they shoot squirrels in the woods. The blow-gun is a narrow tube, about six feet long, made of a cane-reed, or some pithy wood, through which they drive slender arrows by the force of the breath. The arrows are not much thicker than the lower string of a violin: they are generally headed with small triangular bits of tin; and round the opposite ends, for the length of two inches, a quantity of the down of thistles, or something very like it, is bound, so as to leave the arrows at this part of such a thickness that they may but barely pass into the tube. The arrows are put in at the end of the tube that is held next to the mouth, the down catches the breath, and with a smart puff they will fly to the distance of 50 yards.

SENECEY, or Grand SENNECEY, a town of France, in the department of the Saône and Loire, and chief place

of a canton, in the district of Chalons sur Saône; 8 miles S. of Chalons sur Saône. The place contains 2345, and the canton 13,612 inhabitants, on a territory of 222½ kilometres, in 18 communes.

SENECIO, in *Botany*, an ancient name, occurring in Pliny, derived from *senex*, an old man; or *senescere*, to grow old; which is said to have been borrowed from the fancied resemblance of its capitate seed-down to the grey or silvery head of age.—Linn. Gen. 424. Schreb. 555. Willd. Sp. Pl. v. 3. 1973. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 881. Prodr. Fl. Græc. Sibth. v. 2. 176. Ait. Hort. Kew. v. 5. 36. Thunb. Prodr. 157. Pursh. 528. Tournef. t. 260. Juss. 181. Lamarck Illustr. t. 676. Gærtn. t. 166. (Jacobæa; Gærtn. t. 170.)—Class and order, *Syngenesia Polygamia-Superflua*. Nat. Ord. *Compositæ Discoidæa*, Linn. *Corymbifera*, Juss.

Gen. Ch. *Common calyx* calyculate, conical, truncated; scales awl-shaped, numerous, parallel and contracted into a cylinder at the upper part, contiguous, equal; not so numerous at the base, but imbricated, withering at the tip. *Cor.* compound, higher than the calyx; *florets* of the disk perfect, tubular, numerous, funnel-shaped, with a five-cleft, reflexed limb; those of the radius, if any, female, ligulate, oblong, slightly three-toothed. *Stam.* (in the perfect florets) Filaments five, capillary, very small; anthers cylindrical, tubular. *Pist.* (in all the florets) Germen ovate; style thread-shaped, the length of the stamens; stigmas two, oblong, revolute. *Peric.* none, except the conical, converging calyx. *Seeds* in both kinds of florets alike, solitary, ovate, crowned with capillary, long down. *Recept.* naked, flat.

Obf. *Senecio* of Tournefort and others, is destitute of a common radius to the corolla, whereas their *Jacobæa* is furnished with one. This, however, is by no means a sufficient generic distinction. Most authors have accordingly united them into one genus.

Eff. Ch. Receptacle naked. Down simple. Calyx cylindrical, many-leaved, equal, scaly at the base; scales dead at the tip.

In the *Species Plantarum* of Linnæus we meet with only forty species of *Senecio*, (to which however many others are added in his *Supplementum Plantarum*;) whereas Willdenow enumerates one hundred and twenty-two. These are divided into the four following sections, from each of which we shall select a few species in order to give as clear and concise an account of this extensive genus as we are able.

SECT. 1. *Floribus flosculosis*. Flowers without a radius.

S. reclinatus. Grass-leaved Groundsel. Linn. Suppl. 369. Willd. n. 1. (*S. graminifolius*; Jacq. Ic. Rar. v. 1. t. 174.)—Corolla naked. Calyx ventricose, somewhat imbricated. Leaves thread-shaped, linear, quite entire, smooth.—Native of the Cape of Good Hope, flowering from June to August. Stem herbaceous, about three feet high, wavy, reclined and branched at the top, yellowish-green, round. Leaves sessile, scattered, grassy, spreading, revolute at the edge, rough. Flowers terminal, paniced, golden-coloured, with a glaucous calyx.

S. purpureus. Purple Groundsel. Linn. Sp. Pl. 1215. Willd. n. 6. (*Cacalia villosa*; Jacq. Ic. Rar. v. 3. t. 580.)—Corolla naked. Leaves lyrate, hairy; the upper ones lanceolate, toothed.—Native also of the Cape, and flowering from June to September. Root perennial, thick. Stems numerous, erect, a foot high, striated. Leaves alternate, lyrate, obtuse, thickish; the lower ones on long stalks; all beautifully veined. Flowers terminal, corymbose, purple, rather small.

S. cernuus. Drooping Groundsel. Linn. Suppl. 370.

Willd. n. 7. (*S. rubens*; Jacq. Hort. Vind. v. 3. t. 98.)—Corolla naked. Leaves elliptical, toothed or serrated, rather hairy. Stalks elongated, single-flowered.—Native of the East Indies, flowering in July and August. Stem herbaceous, a foot high, erect. Leaves alternate, stalked, veined, rough, with two little angulated stipulas at the base of each footstalk. Flowers solitary, terminal, violet-coloured, on long, generally drooping stalks.

S. Pseudo-China. Chinese Groundsel. Linn. Sp. Pl. 1216. Willd. n. 18. (*S. madraspatanus*, *rapi folio*, *floribus maximis*, *cujus radix a nonnullis China dicitur*; Dill. Elth. v. 2. 345. t. 258. f. 335.)—Corolla naked. Leaves lyrate, pinnatifid, toothed. Flower-stalk nearly naked, very long.—Native of the East Indies, flowering from June to August. Root perennial, tuberous, fleshy, fibrous. Stem none. Leaves radical, large, shaped like those of a turnip, smooth. Flower-stalk slender, more than a foot high, sustaining a few yellow flowers at the top.

S. vulgaris. Common Groundsel, or Simson. Linn. Sp. Pl. 1216. Engl. Bot. t. 747. Curt. Lond. fasc. 1. t. 61.—Flowers without a radius, scattered. Leaves sinuated in a pinnate form, toothed, embracing the stem. A common weed, flowering throughout the year, in any kind of soil or situation. Root annual, fibrous. Stem erect, branched, leafy, somewhat paniced, round, angular, either smooth or clothed with a cottony down like the back of the foliage. Leaves alternate, bright green; radical ones stalked; those of the stem sessile, auriculate. Flowers terminal, scattered or paniced, yellow. Seeds furrowed, pubescent. Seed-down sessile, rough. The great peculiarity of *Senecio* in having the scales of the calyx withered, and black at the tip, is very conspicuous in the present species, whose flower-buds and young tops are the food of many small birds, and especially domestic Canary-birds. In several parts of England it is called Simson, apparently a corruption of the generic name, perhaps through the medium of the French *Seneffon*.

The remaining species of this section, described by Willdenow, are, *S. angustifolius*, *mucronatus*, *niveus*, *hieracifolius*, *erubescens*, *perficifolius*, *biflorus*, *paniculatus*, *bidentatus*, *scaber*, *vestitus*, *virgatus*, *divaricatus*, *croaticus*, *japonicus*, *peucedanifolius*, *arabicus*, and *verbenefolius*.

SECT. 2. *Floribus radiatis, radio statim revoluti*. Flowers with a revolute radius.

S. viscosus. Stinking Groundsel. Linn. Sp. Pl. 1217. Engl. Bot. t. 32.—Radius revolute. Leaves pinnatifid, viscid. Scales of the calyx lax, and nearly as long as the calyx itself, which is hairy. Not uncommon in many parts of Britain, in a chalky or sandy soil; flowering from July to October. The whole herb is hairy and viscid, with a very fetid smell. Root annual. Stem a foot high, much branched, spreading, furrowed, leafy. Leaves alternate, sessile, very slightly embracing the stem, pinnatifid, somewhat toothed. Flower-stalks solitary, terminal, each bearing a flower of a bright gold colour.

S. lividus. Green-scaled Groundsel. Linn. Sp. Pl. 1216. Engl. Bot. t. 2515. (*S. corollis revolutis*, *foliis amplexicaulis lanceolatis dentatis*, *squamis calycinis brevissimis intactis*; Linn. Hort. Upf. 261.)—Radius revolute. Leaves clasping the stem, lanceolate, pinnatifid, and toothed. Scales of the calyx short; their points acute and not discoloured.—Native of Spain, and lately discovered by W. Middleton, esq. in Yorkshire. It flowers in October. "This new British species," says the author of English Botany, "is most like *S. sylvaticus*, but the essential and all-sufficient marks of distinction are the dilated base of the leaves which embrace

SENECIO.

embrace the stem, and the taper-pointed scales at the base of the calyx, which are not blackened and abrupt at the tip, as in perhaps every other *Senecio*." This species varies much in the depth of the segments of its leaves. The florets of the radius are not at first revolute, but gradually become so.

S. sylvaticus. Mountain Groundfel. Linn. Sp. Pl. 1217. Engl. Bot. t. 748. "Fl. Dan. t. 869."—Radius revolute. Leaves pinnatifid, lobed, toothed. Scales of the calyx short. Stem erect, straight, corymbose.—Common in bushy spots upon gravelly or sandy heaths, flowering in July. Root annual. Stem three feet high, leafy, furrowed, rather hairy, many-flowered. Leaves numerous, scattered, with an unpleasant smell, and slightly viscid. Flowers yellow, but paler and smaller than in *sylvaticus*, of which some authors have considered this as a variety, but from which it is perfectly distinct.

The remaining species of Willdenow in this section are, *S. triflorus*, *egyptius*, *australis*, *lautus*, *crassifolius*, *humilis*, *leucanthemifolius*, *auritus*, *giganteus*, *telephifolius*, *trilobus*, *cinerascens*, *javanicus*, *coronopifolius*, *multifidus*, *nebrodensis*, *glaucus*, and *varicosus*.

SECT. 3. *Floribus radiatis, radio patente; foliis pinnatifidis*. Flowers with a spreading radius and pinnatifid leaves.

S. hystatus. Spleen-wort-leaved Groundfel. Willd. n. 45. (*Jacobæa afra* pereunis viscosa lutea, asplenii foliis; Dill. Elth. 183. t. 152. f. 184.)—Radius spreading. Leaf-stalks embracing the stem. Flower-stalk thrice as long as the leaf. Leaves hastate, sinuated.—Native of the Cape of Good Hope, flowering most part of the summer. Stem herbaceous, perennial, about two feet high, branched at the bottom. Leaves stalked, narrow, seven or eight inches long, very glutinous. Flowers terminal, yellow, two or three on each stalk.

S. elegans. Elegant Groundfel, or Purple Jacobæa. Linn. Sp. Pl. 1218. Willd. n. 58. Curt. Mag. t. 238.—Radius spreading. Leaves hairy, viscid, pinnatifid, equal, much-spreading. Common stalk narrowed below. Calyx hairy.—Native also of the Cape, flowering from June to autumn. Linnæus gave to this annual the name of *elegans*, because of the beauty of its flowers, their radius being of a most brilliant purple, and their disk bright yellow; colours peculiar to this and *S. venustus*, Willd. n. 57.—The stem is about eighteen inches high, erect, branched, furrowed. Leaves at the stem-joints, bright green. The figure of Curtis exhibits a beautiful variety of this species, with double flowers, whose colours are equally brilliant as when single. It occasionally produces white flowers.

S. squalidus. Inelegant Ragwort. Linn. Sp. Pl. 1218. Engl. Bot. t. 600.—Radius spreading, longer than the calyx; its florets elliptical and entire. Leaves pinnatifid; their segments distant, somewhat linear. Plentiful on almost every wall in and about Oxford, flowering from June to October. Root annual or biennial. Stem erect, branched, much spreading, sometimes a little hairy. Leaves sessile, deeply pinnatifid, narrow, smooth, flat, rather fleshy, often purplish beneath. Flowers solitary, of a bright golden yellow, on terminal, solitary, bracteated, corymbose stalks. The whole herb has a peculiar smell, somewhat like Tansy or Mugwort.

S. abrotanifolius. Southern-wood leaved Groundfel. Linn. Sp. Pl. 1219. Jacq. Austr. t. 79.—Radius spreading. Leaves pinnatifid, jagged; leaflets linear, naked, acute. Stalks mostly two-flowered.—Native of the Austrian Alps, flowering from July to October. Root perennial, composed of many, long, slender fibres, striking deep, and spreading on all sides. Stem from one to two feet high,

striated upwards. Lower leaves bipinnatifid, stalked; upper pinnatifid, sessile; all dark green above, glaucous beneath. Flowers large and handsome, lemon-coloured, in terminal bunches.

S. tenuifolius. Hoary Ragwort. Willd. n. 75. Engl. Bot. t. 574. Jacq. Austr. t. 278.—Radius spreading. Leaves pinnatifid, somewhat revolute; paler and shaggy beneath. Stem erect, cottony.—Found occasionally in woods, on hedges, and by road sides, chiefly in a calcareous soil, flowering in July and August. Root perennial, rather creeping. Stem erect, wand-like, furrowed, leafy, corymbose at the top. Leaves numerous, alternate, embracing the stem, more or less cottony beneath, and often white with down. Flowers corymbose, bright yellow. This is certainly distinct from *S. erucifolius* of Linnæus, says the author of English Botany, who is inclined to think it may rather be a variety of *sylvaticus* which it more nearly resembles.

S. Jacobæa. Common Ragwort. Linn. Sp. Pl. 1219. Engl. Bot. t. 1130. Mart. Rust. t. 85.—Radius spreading. Leaves doubly pinnatifid, somewhat lyrate, divaricated, toothed, smooth. Stem erect.—Abundant in all kinds of waste ground, flowering in the height and drought of summer, when "it forms a contrast with the surrounding scorched and withered herbage." Root perennial, fibrous. Stem erect, branched, striated, smoothish, leafy, corymbose, many-flowered. Leaves mostly smooth, dark green, cut into various, spreading, toothed segments. Flowers very numerous, of a bright, golden yellow, terminal, corymbose. A cottony web, more or less dense, frequently invests the flower-stalks and calyx.

S. aquaticus. Marsh Ragwort. Willd. n. 77. Sm. Fl. Brit. 885. Engl. Bot. t. 1131. Fl. Dan. t. 784.—Radius spreading; florets elliptical. Leaves lyrate, serrated; the lowermost obovate and undivided. Seeds smooth.—Very common in moist meadows and ditches, where it flowers from July to the end of autumn. The herbage of this perennial is mostly smooth, except when it grows in dry situations, and then it is sometimes a little woolly. Stem erect, branched, purplish at the base, like the last species. Leaves variable in shape, from ovate to deeply pinnatifid, of a much lighter green than in *Jacobæa*. The flowers are larger, fewer in number, and of a brighter colour; but the entire smoothness of its seeds constitutes the most striking mark of specific distinction between this and the last, of which Linnæus considered it only as a variety. "In having the seeds both of the disk and radius quite smooth, it differs (says sir J. E. Smith) from every other *Senecio* we have been able to examine."

The remaining species of Willdenow in this section are, *S. squamosus*, *incisus*, *carneus*, *abruptus*, *lyratus*, *spiræifolius*, *pubigerus*, *vernalis*, *montanus*, *rupestris*, *dentatus*, *venustus*, *erucifolius*, *speciosus*, *erosus*, *uniflorus*, *incanus*, *carniolicus*, *parviflorus*, *muricatus*, *lævigatus*, *grandiflorus*, *myrrhifolius*, *diffusus*, *canadensis*, *delphinifolius*, *auriculatus*, *aureus*, *Balsamita*, *obovatus*, and *umbellatus*.

SECT. 4. *Floribus radiatis; foliis indivisis*. Flowers with a radius. Leaves undivided.

S. paludosus. Great Fen Ragwort. Bird's-tongue. Linn. Sp. Pl. 1220. Engl. Bot. t. 650. Fl. Dan. t. 385.—Radius spreading. Leaves sword-shaped, sharply serrated, somewhat woolly beneath. Stem perfectly straight.—Native of Europe in fens and marshes, but very rare in Britain. It flowers in June and July. Root perennial, of many long, simple fibres. Stems erect, from three to six feet in height, simple, leafy, round, striated, hollow, clothed with a loose down. Leaves sessile, scattered, narrowed at the

the base, smooth above, paler and downy beneath. *Flowers* above an inch in diameter, bright yellow; in a kind of terminal corymb, the lowermost *stalks* arising from the bosoms of the upper leaves.

S. nemorensis. Branching Groundfel. Linn. Sp. Pl. 1221. Jacq. Aufr. t. 184.—Radius nearly revolute. Leaves ovato-lanceolate, ferrated, fringed at the margin, very slightly downy beneath, sessile, unequal at the base.—Native of Austria and Switzerland; flowering in July and August. *Root* perennial, fibrous, not creeping. *Stems* generally single, two or three feet high, erect, slightly angular or grooved towards the top, pale green, purplish here and there. *Leaves* alternate or scattered, five or six inches long, pointed, smooth above, hairy beneath. *Flowers* very numerous, yellow, in terminal compound corymbs.

S. saracenicus. Broad-leaved Groundfel. Linn. Sp. Pl. 1221. Engl. Bot. t. 2211. Jacq. Aufr. t. 186.—Radius spreading. Flowers corymbose. Leaves lanceolate, ferrated, nearly smooth.—Native of the south of Europe, and occasionally though very rarely found in Britain. It flowers in July and August. *Root* perennial, creeping. *Stems* erect, from three to five feet high, angular, leafy, smooth, corymbose at the top. *Leaves* alternate, sessile, lanceolate, slightly downy. *Flowers* bright yellow, in a large, terminal corymb, with narrow, lanceolate, pointed *bractææ*, and rather downy *stalks*.—This is one of our rarest British plants. The specific name alludes to its being used by the Saracens as a vulnerary. Its qualities are astringent, with considerable acrimony.

S. Doria. Broad-leaved Groundfel. Linn. Sp. Pl. 1221. Willd. n. 97. Jacq. Aufr. t. 185.—Radius spreading. Outer scales of the calyx spreading. Leaves somewhat decurrent, oblong-lanceolate, glaucous, smooth, ferrated.—Native of Austria, flowering from July to September.—*Root* perennial, brownish, bitter, with long white fibres. *Stem* from two to five feet in height, much branched upwards, striated. *Leaves* alternate, lower ones stalked; upper sessile; all of them extremely glaucous and ribbed. *Flowers* rather small, numerous, palish yellow, in terminal, compound corymbs.

S. Doronicum. Alpine Groundfel. Linn. Sp. Pl. 1222. Willd. n. 100. Jacq. Aufr. t. 45. App.—Radius spreading. Stem simple, mostly single-flowered. Leaves undivided, ferrated; radical ones ovate, hairy beneath.—Native of the south of Europe, flowering from July to September.—*Root* perennial, fibrous. *Stem* perfectly simple, hairy. *Radical leaves* stalked, thickish, plain or striated on either side of the mid-rib; *stem-leaves* small, lanceolate, nearly awl-shaped. *Flowers* large, terminal, mostly solitary, of a deep yellow or orange-colour, on longish, thick, hairy *stalks*.

S. lanceus. Spear-leaved Groundfel. Willd. n. 102. Jacq. Hort. Schoenbr. t. 304.—Radius spreading. Leaves lanceolate, heart-shaped, and embracing the stem at the base, smooth, deeply ferrated. Stem shrubby.—Native of the Cape of Good Hope, flowering from July to October.—*Root* perennial, fibrous. *Stems* numerous, annual, round, smooth; from four to six feet high, streaked with purple. *Leaves* alternate, somewhat leathery, smooth, glaucous, pointed, veined with purple. *Flowers* in terminal, thick, compound corymbs, bright yellow; the *disk* turning brown.

The remaining species of this last and fourth section described by Willdenow, are the following.—*S. linifolius*, *juniperinus*, *rosmarinifolius*, *asper*, *striatus*, *cruciatus*, *rigescens*, *pinnulatus*, *hadiensis*, *ovatus*, *coriaceus*, *orientalis*, *Barrelieri*, *arenarius*, *glastifolius*, *oporinus*, *longifolius*, *undulatus*, *byzan-*

tinus, *heterophyllus*, *balimifolius*, *marginatus*, *maritimus*, *lanatus*, *mollis*, *quercifolius*, *ilicifolius*, *crispus*, *crenatus*, *angulatus*, *cordifolius*, *repandus*, *rigidus*, and *solidaginoides*.

SENECIO, in *Gardening*, contains plants of the herbaceous, annual, and perennial kinds, of which the species cultivated are; the hieracium-leaved groundfel (*S. hieracifolius*); the Chinese groundfel (*S. pseudo-china*); the spleenwort-leaved groundfel (*S. hastatus*); and the elegant groundfel, or purple jacobæa (*S. elegans*).

In the fourth species there are varieties with very double purple, and with equally double white flowers. The former is now chiefly cultivated.

And there are other species that may be cultivated for variety.

Method of Culture.—The first and two last sorts are readily increased by planting cuttings of the branches in pots filled with fine mould in the summer season, shading them till they have taken root; and, as the winter approaches, removing them under the protection of the greenhouse, where they should remain till May, when they may be planted out in the borders or clumps. They may likewise be raised from seed, which should be sown in the spring in pots, and placed in a gentle hot-bed.

The second sort should be more carefully attended to, being raised from offsets, which should be planted in pots in the spring season, and be plunged in the hot-bed of the stove, where the plants should be constantly kept.

The first and two last sorts afford variety in the borders, and among potted plants; and the second in stove collections.

SENECTA ANGIUM, the exuvizæ, or sloughs of serpents. The snakes cast their whole skin, and with it were supposed to cast off their age, and be born anew; whence the name of these cast skins. A decoction, or infusion of these, is recommended by medical writers against pains of the ears and eyes, and some superstitious people recommended it to women to tie about their waists, to prevent miscarriages, and about their thighs, in time of labour to hasten delivery.

SENEFFE, in *Geography*, a town of France, in the department of Jemappe, and chief place of a canton, in the district of Charleroy; 13 miles N.W. of Charleroy. The place contains 2531, and the canton 12,063 inhabitants, on a territory of 167½ kilometres, in 13 communes.

SENEGA. See GUM Senega.

SENEGAL, or SENEGAMBIA, in *Geography*, a country of Africa, situated between the rivers Senegal and Gambia, and including many kingdoms and states. It derives the former name from the river Senegal, and the latter from that of Gambia. According to Bruns, all the coast extending from Cape Blanco to the mountains to the N. of Senegal, has been called Upper Senegambia. It is frequented by the Moors, wandering shepherds in the desert of Zaara or Sahara. They acknowledge the supremacy of the emperor of Morocco; but only obey him as they find it to be their interest. The Europeans trade with these people in gum; and the establishment of Portendek, formed by the Dutch, and that of Arguin, have been disputed by several European nations, with inconceivable eagerness. The dreadful portrait which Mungo Park has given us of the foolish pride, perfidy, and barbarity of the Moors of the environs of Tombuctoo, perfectly agrees with that given by Brisslon of those who inhabit the coasts. The whole country watered by the rivers of Senegal and Gambia has been called Senegambia, and extends, according to Bruns, from the northern shores of Senegal to the northern shores of Sierra Leone.

SENEGAL.

SENEGAL, a river of Africa, which rises in the interior of the country, and runs, after a winding course, into the Atlantic. It takes its rise by various streams in a chain of mountains, situated, according to Mr. Park's discoveries, between the 5th and 9th degrees of west longitude, and directs its course towards the N.W. Within the same space are the sources of the Gambia, which runs to the W.N.W., and those of the Joliba or Niger flowing towards the E.N.E. A large portion of the tract bordering on the northern foot of the mountains, whence the branches of the Senegal river issue, is covered with thick forests. One part of this tract is denominated the Jallonka wilderness, in which no habitations are to be seen during nine days of forced marching. The head of the principal branch of the Senegal is about 80 geographical miles W. of that of the Joliba; and the head of the Gambia is about 100 miles W. of the Senegal. The branches of the latter are very numerous, and intersect the country for about 200 miles from E. to W., in the line of the caravan route. In Mr. Park's judgment, the Senegal river, below the falls of F'low, or Feloe, as Labat calls it, was about the bulk of the Tweed at Melrose in summer; but this was in the dry season, or Christmas; and as the river does not swell periodically, till many months after that, Mr. Park did not see it at its lowest pitch. And yet this was the assemblage of all the rivers, the Falemé excepted, which was itself about three feet deep at the same season. But the Senegal is even fordable in some places before the conflux of the Falemé, according to Labat; for the Moors cross it in the dry season, and commit depredations on some of the lands to the south. However, almost all the towns and villages are placed on the south side, with a view of being in security for the longest possible term. The Senegal river is then by no means a very capital stream, except in the rainy season; when, like all the other tropical rivers, its bed is filled, and it very commonly overflows. Mr. Park observed, by the mark of the highest point of swelling of the river Kokaro, or eastern branch of the Senegal, that it had been twenty feet higher than when he crossed it, in the line of the southern route. The main branch of this river, the Ba-fing, or Black river, was not fordable, and was crossed over a temporary bridge of a very singular construction. Alligators and crocodiles are found in all these rivers, at the height at which Mr. Park passed them. The Falemé river has a remote source, and drains a great extent of country. The great body of the river Senegal is precipitated from the upper level, containing the political divisions of Manding, Jallonkadu, Fooladu, Kasson, Gadon, and some other smaller states, to the intermediate one; thus forming the falls of Govinea. The intermediate level contains Bambouk, Konkadoo, Satadoo, Dentila, and some others, and is bounded on the S.W. by the great slope of country at Kirwanney, when the waters first begin to flow towards the W. On the N.W. it is bounded by the great descent which forms the second or lower fall of the Senegal river, named F'low. This fall is about 30 miles below Govinea, 48 above fort. St. Joseph; and here the river, being arrived at the lowest level of the country, continues navigable, with little interruption, to the sea. The Falemé river, of course, must run on a far lower level than the other heads of the Senegal river. The distance between Kooniakarry in Kasson, lat. $14^{\circ} 34'$, and the Senegal river, 13 miles, points to a W.N.W. course, or thereabouts, of the river between the falls; not much different from its general course, lower down. But as the Ba-fing, or principal arm of the river, must run almost directly to the N. from the place where Mr. Park crossed it, in Jallonkadu, it is highly probable that the two great branches unite at no great distance

above the upper fall: the same ridge of mountains that occasion the fall, may, perhaps, occasion a junction of the different streams above it. These falls are said by Labat to be from 30 to 40 toises perpendicular, or 180 to 240 French feet. The Senegal, in its course, separates the two countries of Kajaaga and Kasson.

Within six miles of the sea, the river in its course takes a sudden turn to the south, and for the remainder of its passage is divided from the sea only by a natural ridge of sand, sometimes not 100 toises over. By this curve it prolongs its course for 75 miles farther, from north to south, till at length it discharges itself into the ocean, in N. lat. $15^{\circ} 50'$. This great river separates the country of the Negroes from the Moors of Sahara, or the Desert, stretching by a number of windings to a prodigious length, from east to west. The extreme rapidity of this river is attributed to the space passed through by so large a body of water, confined within so narrow a channel; the mouth of it being no more than a mile and a half over, and that choked up with sand, called a bar, which renders the passage exceedingly difficult and dangerous. This bar is doubly dangerous, on account not only of the shallowness of the water at all times, but the shifting of the bar, and the change of its situation after floods and heavy rains, by which the channels are lost, and new soundings requisite to discover them; indeed the Senegal would be quite shut up, but for one channel of 200 toises in breadth, and two fathoms depth, which has long kept its situation immovable, amidst the floods and overflowings of the river. This bar prevents ships of 500 tons from entering the river, and mooring under the fort; an inconvenience that obliged the French company to keep a vessel constantly at anchor in the channel, for no other purpose than to keep an account of the soundings. The most commodious time of the year for crossing the bar, is from the month of January till August, the winds being then variable, the river smooth, and the bar fixed till the ensuing rainy season, when the prodigious swell of the river, and south-west winds, opposed to its rapid course, raise waves of so prodigious height at the bar, that their clashing resembles the shock of mountains, and so furious, as to dash in pieces the stoutest ship. After crossing the bar, it becomes a beautiful, smooth, and gently gliding river, at four fathoms depth. In advancing three miles higher, the country on the south side is clothed with a beautiful verdure, the trees in perpetual bloom, than which nothing can form a more agreeable contrast to the dry, sandy, and barren points of land, that first present themselves to the shipping. All around it lie a great number of islands, pleasantly stocked with trees, fruits, herbage, and birds, but appropriated to no use, except the island of Senegal.

Fort St. Louis, at the mouth of the Senegal river, according to the observations and results of M. D'Anville and M. Fleurieu, is placed in lat. $16^{\circ} 5'$ (by D'Anville), long. $16^{\circ} 8'$ by Fleurieu: and Cape Verd in lat. $14^{\circ} 48'$, long. $17^{\circ} 34'$ W. of Greenwich. By the treaty of 1783, the river of Senegal and its dependencies were left in the possession of the French, who had extended their factories above 500 miles from the shore. In 1784 was founded the company of the gum of Senegal, which obtained an exclusive privilege of trading in gum, slaves, gold-dust, ivory, wax, and other products of the river Senegal, and dependencies, from Cape Blanco to Cape Verd. Goree was chosen as the residence of the administrators. In 1791 this company was suppressed by the national assembly, and the trade with Senegal was declared free.

The Moors chiefly gather the gum in the three forests of Sokel,

Sokel, Eliabar, and Alfectak, situated on the north of the island St. Louis. The season is the month of March, and the consumption in Europe is estimated at a thousand tons, each of 2000 pounds. In 1788, different ports in France employed in this trade 105 ships, the tonnage exceeding 35,000. The French settlement on the coast of Africa, according to Herbin, is Arguin, a little isle granted to the company of Senegal in 1727. A considerable trade in gum was maintained with the river St. Juan, which is not far distant; and by the treaty of 1783 the English obtained the right of trading with this river. On the river Senegal there were several French settlements, particularly in the isle of St. Louis at the mouth of that river, which is a great feat of the gum trade. The white population may be about 400; but in 1801 the whole, including captives, was computed at 10,000.

SENEGAL, an island of Africa, in the river so called, about one mile and a quarter in length, from north to south, and almost half a mile in breadth, from east to west. It is composed of a bed of loose sand, productive of nothing but what is forced by art and the richest manure, notwithstanding which it contains 3000 inhabitants, whose principal food is fish and maize. This sort of corn grows in great plenty almost all over the whole country. It may seem surprising, that a part of the world so very unhealthy as this, should yet be so populous, but the wonder will cease when we come to understand, that the greatest pride among the men consists in the number of their wives; so that every one takes as many as he is able to maintain; some six, others eight, and others twelve at a time. In the year 1758, this island was taken from the French by the British troops, and by the peace of 1763 it was ceded to Great Britain. N. lat. 16° 5'.

SENEGALIA, or SENEGALLUS, in *Ornithology*, the *Loxia aspill*. See LOXIA. See also FRINGILLA *Senegala*.

SENEKA, RATTLESNAKE-ROOT. This is a root lately brought into use among us, and which seems to deserve very great regard. It is the root of a species of polygala, or milk-wort, (see POLYGALA *Senega*), distinguished by Gronovius, in his *Flora Virginica*, under the name of the erect polygala, with a simple stalk, with oval leaves, pointed at the end, and with an erect cluster of flowers. We generally call it the rattlesnake-root, and the French, from the place whence it comes, *Seneka*. The plant is a native of Virginia, Pennsylvania, and Maryland, and is cultivated in some of our gardens.

The root is perennial; the thickness of it is generally about that of a man's little finger. It is four or five inches, or more, in length, and is variously contorted and twisted, and divides into many branches, furnished with small fibres, and with a membranaceous rim running all along it. It is yellowish on the outside, and white within, very acrid, and somewhat bitter to the taste, and has somewhat of an aromatic flavour. From this root arise numerous stalks, all simple, and without branches; some lie on the ground, others stand erect. These are ten or twelve inches high, when full grown. The leaves stand alternately on the stalks, and the flowers are white, and perfectly like those of our own kinds of polygala. This root, which is brought from Virginia in bales, each containing from two to four hundred weight, is of no remarkable smell, but has a peculiar kind of subtle, pungent, penetrating taste. Its virtue is extracted both by water and spirit.

Dr. Tennent, who brought over a large quantity of this root from America some years ago, and took great pains to introduce it into practice, praises it very largely as a diuretic, a diaphoretic, and an alexipharmic, and a very

powerful attenuant and resolvent. He says it will sometimes vomit and purge.

The Senegaw Indians first taught the use of it to the Europeans; they esteem it a sovereign remedy against the bite of the rattlesnake; and Dr. Tennent assures us, that he saw two persons, who had been bitten by this creature in the month of July, when its poison is most fatal, perfectly restored to health by it. The powder, or a decoction of the root, is taken internally; and either the powder or cataplasms made with it applied to the wound.

He afterwards gave it in pleurifies and peripneumonies with great success, and in all other cases where the blood is inspissated. The effect of this medicine was found to be, that it made the fizy blood fluid, (which is contradicted by a strong fact adduced by De Haen,) procured a plentiful spitting, increased perspiration and urine, and sometimes purged or vomited. If the first doses of it provoke a vomiting, it is not at all the worse, except in cases in which the patient is very weak; and in such this effect is easily prevented, by giving some of the testaceous powders with it.

In pleurifies it is best to take away ten ounces of blood, before the entering on the use of the medicine; in other cases no precaution is required, but it is to be given in powder, or tincture, in white wine, particularly Madeira wine; and the ordinary drink, during the use of it, should be marshmallow tea. Its good effects in pleurifies have been attested by several of the French academicians and others. But repeated bleeding is not to be neglected.

This medicine may be given either in powder or decoction, and combined with aromatics, opium, or camphor, which check its nauseating qualities; but Dr. Tennent prefers the decoction, having observed it to give relief sooner than the powder does. The dose of the powder is thirty-five grains, and he gives at once three spoonfuls of the decoction, prepared by boiling three ounces of the root bruised in a quart of water to nearly the half. The dose is repeated every six hours. He is also fond of this root in the rheumatism, dropsy, and gout, in which last disease, he says, he has given it with success. See his Letter concerning the *Seneka*, or *rattlesnake-root*. The extract of it in combination with carbonate of ammonia has been found by Dr. Brandreth, of Liverpool, to be efficacious in some cases of lethargy; and in America the decoction given in divided doses, at short intervals till it vomits or purges, has been employed with seeming success in croup; it has also been lately used as a stimulating gargle in the same disease.

The usual dose, says Woodville, is from one scruple to two of the powder, or two or three spoonfuls of a decoction prepared by boiling an ounce of the root in a pint and a half of water till it is reduced to a pint.

Messrs. Lemery, Du Hamel, and Jussieu, vouch for the good effects of the Seneka-root in pleurifies, and other inflammatory diseases. *Mem. de l'Acad. des Scienc.* 1739.

SENEMBI, in *Zoology*, a name given by Marcgrave to the *Lacerta iguana*. See LIZARD.

SENECHAL, SENESCALLUS, a name anciently used for a steward or majordomo; formed from the German *sind*, *house* or *family*, and *scale*, *servant*.

Thus the seneschal of a lord, or a baron, is his steward or bailiff, who holds his courts, and manages his demesne lands; and the sub-seneschal, his under-steward.

High seneschal of England is the high-steward of England; *high seneschal del hotel du roi*, is the steward of the king's household.

The office of seneschal was at all times a great office; but the jurisdiction of it increased much, when the grand justiciary's

justiciary's was diminished; which did not happen till after the decease of king Henry II. Indeed these offices could not possibly have subsisted together, in the height of their power; the functions and dignity appertaining to each of them having been nearly the same. But in the reign of Henry II. that of feneschal was much inferior to the other; and the authority of it seems to have been not very different from that of the lord steward of the household at present.

The ancients used the term *senescallus* indifferently with that of *dapifer*; whence we are sure it signifies *steward*.

SENESCHALLO *et mareschallo quod non teneant placita de libero tenemento*, in *Law*, a writ directed to the steward and marshal of England, inhibiting them to take cognizance of an action in their court that concerns freehold.

SENESINO, FRANCESCO BERNARDO, *Detto*, in *Biography*, called Senefino, from being a native of Siena, one of the greatest singers and the best actor who performed in Handel's operas during the Royal Academy of Music, established in the year 1720, and dissolved in 1729. He continued singing in England till the year 1735; but in an opera established by the nobility and gentry in opposition to Handel.

We have conversed with several good judges of music, who had been constant in their attendance at the operas of those times, who always spoke of Senefino's voice, style of singing, figure, and action, in the highest terms of admiration. In early youth his voice had been a soprano, but it had descended into the fullest, most melodious, and most flexible contralto, that was ever heard in this country. He had not more than six or seven notes in his compass; but these were so mellow and powerful, and his execution of divisions so *granito*, or distinct, that, without the rapidity of a bravura singer, he seemed possessed of every solid and lasting charm of a great performer. Quantz, who heard him at Dresden in 1719, gives him the following character. "Francesco Bernardo, called Senefino, had a powerful, clear, equal, and sweet *contralto* voice, with a perfect intonation, and an excellent shake; his manner of singing was matterly, and his elocution unrivalled; though he never loaded *adagios* with too many ornaments, yet he delivered the original and essential notes with the utmost refinement. He sung *allegros* with great fire, and marked rapid divisions, from the chest, in an articulate and pleasing manner; his countenance was well calculated for the stage, and his action was natural and noble: to these he joined a figure that was truly majestic, but more suited to the part of a hero than a lover."

When he returned to his own country, he sung no more on a stage; but retired to Siena, the place of his nativity, where he built himself a magnificent mansion, called there a palazzo, and ended his days in splendid tranquillity.

SENETOSO, in *Geography*, a cape on the S.W. coast of the island of Corsica; 20 miles W. of Sarcena.

SENEZ, a town of France, in the department of the Lower Alps, and chief place of a canton, in the district of Castellane, before the revolution the see of a bishop, suffragan of Embrun; 6 miles N.W. of Castellane. The place contains 768, and the canton 2081 inhabitants, on a territory of 180 kilometres, in 4 communes.

SENFTEMBERG, a town of Austria; 3 miles N. of Stain.—Also, a town of Bohemia, in the circle of Koniggratz; 3 miles N. of Geyersberg.—Also, a town of Saxony, in the margravate of Meissen, containing about 300 houses, surrounded with ramparts and ditches; 32 miles N.E. of Meissen. N. lat. $51^{\circ} 31'$. E. long. $14^{\circ} 1'$.

SENGANA, a town of Hindoostan, in the Mewat country; 95 miles S.W. of Delhi.

SENGBEST, a town of Persia, in the province of Khorasan; 25 miles S.E. of Meshid.

SENGEN, or SENSEN, a river of Switzerland, which joins the Sanen river, near Laupen, in the canton of Berne.

SE-NGEN, or SEN-GUEN, a city of China, of the first rank, in Quang-si. N. lat. $23^{\circ} 24'$. E. long. $107^{\circ} 34'$.

SENGERSHASARA, a town of Persia, in the province of Ghilan; 69 miles N.W. of Reshd.

SE-NGIN, or SE-NGUEN, a town of China, of the third rank, in Quang-si; 25 miles N.W. of King-yuen.

SENGLEA, a town of the island of Malta, divided by a canal from Vittoriosa; and containing about 4000 inhabitants.

SENGMA, a town of Africa, in the country of Calbari; 5 miles N. of Cape Formosa.

SENGOA, a town of Persia, in the province of Adirbeizan or Azerbaijan; 48 miles S.E. of Tauris or Tabreez.

SENGREEN, in *Botany*. See SAXIFRAGA.

SENGWARDEN, in *Geography*, a town of Germany, in the lordship of Knipphausen; 6 miles E. of Jever.

SENJEN, a small island in the North sea, near the coast of Norway. N. lat. $69^{\circ} 15'$.

SENIGAGLIA. See SINIGAGLIA.

SENINGHEM, a town of France, in the department of the Straits of Calais; 9 miles W. of St. Omer.

SENIONITZ, a town of Bohemia, in the circle of Koniggratz; 6 miles N. of Koniggratz.

SENIORE, a town of Algiers; 22 miles W. of Tifefeh.

SENITO, a river of Naples, which runs into the Sibari.

SENITZ, a town of Hungary; 25 miles W. of Toltzan.

SENKE', a town of Thibet; 24 miles E. of Toud-fong.

SENLIS, a town of France, and principal place of a district, in the department of the Oise, before the revolution the see of a bishop, suffragan of Rheims; $5\frac{1}{2}$ posts N.E. of Paris. The place contains 4312, and the canton 11,690 inhabitants, on a territory of $222\frac{1}{2}$ kilometres, in 18 communes. N. lat. $49^{\circ} 12'$. E. long. $2^{\circ} 40'$.

SENN, a town of Asiatic Turkey, in the government of Mosul, on the Tigris; 80 miles S.S.E. of Mosul.

SENNÄ, or SENNAH, a most romantic and flourishing little town of Persia, in the province of Ardelan, secluded in the bosom of a deep valley, well cultivated and interspersed with orchards of peach, apricot, pear, apple, and cherry trees. Its population amounts to about 8000 persons, of which number 2000 are Jews, Armenians, and Nestorians, who trade to Mosul, Bagdad, and Isfahan. The Wallea, who seldom quits this place, resides in a sumptuous palace, built on the top of a small hill in the centre of the town, where he maintains a degree of state and splendour superior to any thing in Persia, except at court. His house is ever open for the entertainment of strangers, and he always retains about his person a body of horse. The mountains to the W. of Senna are covered with forests of oak, which produce fine timber and abundance of gall-nuts. The former is made into rafts and floated down the Tab into the Tigris; the latter is an article of trade, and exported to India. A small river of the same name flows about one mile and a half or two miles from it. The route from Tabreez by way of Maraga to Sennah is 223 miles; that from Senna by Kermanshaw to Bagdad is 303 miles; and that from Senna to Hamadan is 89 miles.

SENNÄ,

SENNÄ, in *Botany*. See CASSIA.

SENNÄ, *Bladder*. See COLUTEA.

SENNÄ, *Scorpion*. See EMERUS.

SENNÄ, in the *Materia Medica*. See SENA.

SENNÄAR, in *Geography*, a kingdom of Africa, in the country of Nubia, situated on the banks of the Nile, between Egypt and Abyssinia. At the beginning of the 16th century, the whole country from the frontiers of Egypt to those of Abyssinia, though nominally subject to Egypt for the sake of trade, had its own prince of the race of Beni Koreish, whose title was Welled Ageeb, *son of the good*; and he was also called Ali, or Mahomet Welled Ageeb. This prince was, nevertheless, only the sheikh of all the Arabs, to whom they paid a tribute for the support of his dignity and authority. The residence of this Arab prince was at Gerri, a town situated on the ferry which leads across the Nile to the desert of Bakiouda, and the road to Dongola and Egypt, joining the great desert of Selima. In the year 1504, a black nation, hitherto unknown, inhabiting the western banks of the Bahar El Abiad, in about lat. 13°, made a descent, in a multitude of canoes or boats, upon the Arab provinces, and in a battle near Herbagi, defeated Welled Ageeb, and forced him to a capitulation, in consequence of which the Arabs became tributaries to their conquerors, and Welled Ageeb was allowed to retain his place and dignity, on condition that he should be always ready to use coercion in favour of the victors, in case any of the Arabs, who were to enjoy their former possessions unmolested, refused payment; and thus he became, as it were, their lieutenant. This race of Negroes were called in their own country Shillook. It was in the year 1504 that Amru, son of Adelan, the first of their sovereigns on the E. side of the Nile, founded this monarchy, and built Sennaar, which has ever since been the capital. From this period to that in which Bruce visited the country, 266 years had elapsed, and 20 kings had reigned, that is, from Amru the first to Ismain, who was king at the time of Bruce's being at Sennaar. At the establishment of this monarchy, the king, and the whole nation of Shillook, were Pagans. But they were soon after converted to Mahometanism, for the sake of trading with Cairo, and took the name of Funge, which they interpret sometimes lords, or conquerors, and at other times, free citizens; though Bruce says, that titles and dignities are under-valued, and that slavery in Sennaar is the only true nobility. Mr. Bruce has given a list of the kings, with their names and the years of their reign, from 1504 to 1772. Upon the death of a king of Sennaar, his eldest son succeeds by right; and immediately afterwards, as many of the brothers of the reigning prince as can be apprehended are put to death. This practice of murdering all the collaterals of the royal family is similar to that which prevails in Abyssinia, of confining the princes all their lives upon a mountain. In Sennaar, as is also the case in Abyssinia, women do not succeed to sovereignty. The royal family were originally Negroes, and remain so still, when their mothers have been black like themselves; but when the king has happened to marry an Arab woman, as he often does, the black colour of the father cedes to the white of the mother, and the child is white. In and near the metropolis of Sennaar there is a constant mortality among the children, so that the people would probably be extinct, if they were not supplied by a number of slaves, brought from all the different countries to the southward. Hence it is concluded, that the climate must have undergone a strange revolution, as Sennaar is but a small distance from the territory where the ancients placed the Macrobian, so called from the remarkable length of their lives. Al-

though these people are Mahometans, they are so brutal with regard to their women, that they sell their slaves after having lived with them, and even after having had children by them. The king himself, it is said, is often guilty of this unnatural practice, utterly unknown in any other Mahometan country. Once in his reign the king is obliged, with his own hand, to plow and sow a piece of land. From this operation he is called Baady, the countryman or peasant; and this name is common to the whole race of kings, as Cæsar was among the Romans.

No horse, mule, ass, or any beast of burden, will breed or even live at Sennaar, or many miles about it. Poultry does not live there. Neither dog nor cat, sheep nor bullock, can be preserved there for a season. All of them must be removed every half year to the sands. Though all possible care be taken of them, they die in every place where the fat earth is about the town during the first season of the rains. Hence, it appears that the soil of Sennaar is very unfavourable both to man and beast, and particularly adverse to their propagation. This circumstance is ascribed by Bruce to some noxious quality of the fat earth; for this noxious quality is not known in the sands. Aira, between three and four miles from Sennaar, which has no water near it but the Nile, surrounded with white barren sand, agrees perfectly with all animals. Nevertheless this soil contributes very abundantly to the nourishment of man and beast. It is said to render 300 for 1: though this must be an exaggeration; it is sown with *dora* or millet, which is the principal food of the natives. The salt used at Sennaar is wholly extracted from the earth about it, especially at Halfaia, in lat. 15° 45' 54". E. long. 32° 49' 15", so strongly is the soil impregnated with this useful fossil. Halfaia is a large, handsome, and pleasant town, though built with clay. The houses are terraced at the tops. This town is the limit of the rains, and is situated upon a large circular peninsula, surrounded by the Nile from S.W. to N.W. about half a mile from the river. It consists of about 300 houses, and derives its principal gain from a manufacture of very coarse cotton cloth, called Deimour, which serves for small money through all the lower parts of Atbara. The people here eat cats, and also the river-horse and the crocodile, which are very plentiful.

About twelve miles from Sennaar, nearly to the N.W. is a collection of villages called Shaddly, from a great saint, who in his time directed large pits to be dug, and plastered closely within with clay, into which a quantity of grain was put when it was at the cheapest, and these were covered up, and plastered again at the top, which they call *sealing*, and the hole itself *matamore*. These matamores are in great number all over the plain, and, on any prospect of corn growing dearer, they are opened, and corn sold at a low price both to the town and country.

To the north of Shaddly, about twenty-four miles, is another foundation of this sort, called Wed Aboud, still greater than Shaddly. Upon these two charities the chief subsistence of the Arabs depends; for as there is continual war among these people, and their violence being always directed against the crops rather than the persons of their enemies, the destruction of each tribe would follow the loss of its harvest, was it not for the extraordinary supplies furnished at such times by these granaries.

The small villages of soldiers are scattered up and down through this immense plain to watch the grain that is sown, which is *dora* only, and it is said that here the ground will produce no other grain. Prodigious excavations are made at proper distances, which fill with water in the rainy season, and are a great relief to the Arabs in their passage be-

SENNAAR.

tween the cultivated country and the sands. The fly, that inexorable persecutor of the Arabs, never pursues them to the north of Shaddly. The knowledge of this circumstance was what, perhaps, determined the first builders of Sennaar to place their capital here; this too, probably, induced the two saints, Shaddly and Wed Aboud, to make here these vast excavations for corn and water. This is the first resting-place the Arabs find, where, having all things necessary for subsistence, they can at leisure transact their affairs with government.

To the westward of Shaddly and Aboud, as far as the river Abiad, or El-aice, the country is full of trees, which make it a favourite station for camels. As Shaddly is not above three hours ride on horseback from Sennaar, there could not be chosen a situation more convenient for levying the tribute; for though Gerri, from the favourable situation of the ground, being mountainous and rocky, and just on the extremity of the rains, was a place properly chosen for this purpose by the Arab prince before the conquest of the Funge, (for his troops there cut them off, either from the sands, or the fertile country, as he pleased), yet many of them might have remained behind at Shaddly, and to the westward, free from the terror of the fly, and consequently without any necessity of advancing so far north as Gerri, and there subjecting themselves to contribution.

In this extensive plain, near Shaddly, arise two mountainous districts, the one called Jibbel Moia, or the Mountain of Water, which is a ridge of considerable hills nearly of the same height, closely united; and the other Jibbel Segud, or the Gold Mountain, a broken ridge composed of parts, some high and some low, without any regular form. Both these enjoy a fine climate, and are full of inhabitants, but of no considerable extent. They serve for a protection to the Daheera, or farms of Shaddly and Wed Aboud. They are also fortresses in the way of the Arabs, to detain and force them to payment in their flight from the cultivated country and rains to the dry lands of Athara. Each of these districts is governed by the descendant of their ancient and native princes, who long resisted all the power of the Arabs, having both horse and foot. They continued to be Pagans till the conquest of the Funge. Bloody and unnatural sacrifices were said to have been in use in these mountainous states, with horrid circumstances of cruelty, till Abdelcader, son of Amru, the third of the kings of Sennaar, about the year 1554, besieged first the one and then the other of these princes in their mountain, and forced them to surrender; and, having fastened a chain of gold to each of their ears, he exposed them in the public marketplace at Sennaar in that situation, and sold them to the highest bidder, at the vile price of something like a farthing each. After this degradation, being circumcised, and converted to the Mahometan religion, they were restored each to their government, as slaves of Sennaar, upon very easy conditions of tribute, and have been faithful ever since.

Nothing is more pleasant than the country around Sennaar, in the end of August and beginning of September, I mean. (says Bruce) so far as the eye is concerned; instead of that barren, bare waste, which it appeared on our arrival in May, the corn now sprung up, and covering the ground, made the whole of this immense plain appear a level, green land, interspersed with great lakes of water, and ornamented at certain intervals with groups of villages, the conical tops of the houses presenting, at a distance, the appearance of small encampments. Through this immense, extensive plain, winds the Nile, a delightful river there, above a mile broad, full to the very brim, but never overflowing. Every where on these banks are seen numerous herds of the most beautiful

cattle of various kinds, the tribute recently extorted from the Arabs, who, freed from all their vexations, return home with the remainder of their flocks in peace, at as great a distance from the town, country, and their oppressors, as they possibly can.

The banks of the Nile about Sennaar resemble the pleasantest parts of Holland in the summer season; but soon after, when the rains cease, and the sun exerts his utmost influence, the dora begins to ripen, the leaves to turn yellow and to rot, the lakes to putrefy, smell, and be full of vermin, all this beauty suddenly disappears; bare, scorched Nubia returns, and all its terrors of poisonous winds and moving sands, glowing and ventilated with sultry blasts, which are followed by a troop of terrible attendants, epilepsies, apoplexies, violent fevers, obstinate agues, and lingering, painful dysenteries, still more obstinate and mortal.

War and treason seem to be the only employment of this horrid people, whom heaven has separated, by almost impassable deserts, from the rest of mankind, confining them to an accursed spot, seemingly to give them earnest in time (as Mr. Bruce forebodes) of the only other worse which he has reserved to them for an eternal hereafter.

The dress of Sennaar is very simple. It consists of a long shirt of blue Surat cloth called Marowty, which covers them from the lower part of the neck down to their feet, but does not conceal the neck itself; and this is the only difference between the men's and the women's dress; that of the women covers their neck altogether, being buttoned like ours. The men have sometimes a sash tied about their middle; and both men and women go bare-footed in the house, even those of the better sort of people. Their floors are covered with Persian carpets, especially the women's apartments. In fair weather, they wear sandals; and without doors they use a kind of wooden patten, very neatly ornamented with shells. In the greatest heat at noon, they order buckets of water to be thrown upon them instead of bathing. Both men and women anoint themselves, at least once a day, with camels' grease mixed with civet, which they imagine softens their skin, and preserves them from cutaneous eruptions, of which they are so fearful, that the smallest pimple in any visible part of their body keeps them in the house till it disappears: for the same reason, though they have a clean shirt every day, they use one dipt in grease to lie in all night, as they have no covering but this, and lie upon a bull's hide, tanned, and very much softened by this constant greasing, and at the same time very cool, though it occasions a smell that no washing can free them from.

The principal diet of the poorer sort is millet, made into bread or flour. The rich make a pudding of this, toasting the flour before the fire, and pouring milk and butter into it; besides which, they eat beef, partly roasted and partly raw. Their horned cattle are the largest and fattest in the world, and are exceedingly fine; but the common meat sold in the market is camel's flesh. The liver of the animal, and the spare rib, are always eaten raw through the whole country. Bruce never saw one instance where it was dressed with fire; it is not then true that eating raw flesh is peculiar to Abyssinia; it is practised in this instance of camels' flesh in all the black countries to the westward.

Hogs' flesh is not sold in the market; but all the people of Sennaar eat it publicly: men in office, who pretend to be Mahometans, eat theirs in secret.

There are three principal governments in the kingdom of Sennaar. The first is at El-aice, the capital of that country, from which the Shillook came. The Bahar el Abiad spreads

SENNAAR.

spreads itself all over the territory, and, divided into a quantity of small channels, (whether by art or nature we know not,) furrounds a number of little islands, upon each of which is a village, and this collection of villages is called the town of El-aice. The inhabitants are all fishermen, and have a number of boats, like canoes, in which they sail up and down to the cataracts. With incredible fleets of these their invasion was made when they undertook the conquest of the Arabs, who had not the smallest warning of the attempt. They had, at that time, no weapons of iron: their swords and lances were of a hard wood called Dengui-Sibber. It must be a relation of the Mek of Sennaar that commands at El-aice; and he is never suffered to leave that post, or come to Sennaar.

The second government, next to this in importance, is Kordofan. The revenue consists chiefly in slaves procured from Dyre and Tegla. It seems this situation is the most convenient for invading those mountains, either from its having water in the way, or from some other circumstance that is not known. Mahomet Abou Kalec had this government, and with him about 1000 black horse, armed with coats of mail, with whom he maintained himself at this time independent of the king. It is a frontier nearest to Dar-Fowr, a black state still more barbarous, if possible, than Sennaar, and by them it often has been taken from Sennaar, and again retaken.

The third government is Fazuclo, bounded by the river El-aice on the west, and the Nile on the east, and the mountains of Fazuclo, where are the great cataracts, on the south. These are part of the large chain of mountains of Dyre and Tegla, which reach so far westward into the continent, from whence comes the chief supply both of gold and slaves which constitute the riches of this country; for the greatest part of the revenue of Fazuclo is gold; and the person that commands it is not a Funge, but the same native prince from whom the army of Sennaar conquered it. This seems to be a very remarkable piece of policy in this barbarous nation, which must have succeeded, as they constantly adhere to it, of making the prince of the state they have conquered their lieutenant in the government of his own country afterwards. Such was the case with Dongola, whose Mek they continue; also with Wed Ageeb, prince of the Arabs, whom they subdued; and such was the case with Fazuclo, Wed Aboud, Jibbel Moia, and other petty states, all of which they conquered, but did not change their prince.

The forces at Sennaar, immediately around the capital, consist of about 14,000 Nuba, who fight naked, having no other armour but a short javelin and a round shield, very bad troops, as Bruce supposes; about 1800 horse, all black, mounted by black slaves, armed with coats of mail, and without any other weapon but a broad Slavonian sword. These, he supposes, by the weight and power of man and horse, would bear down, or break through double the number of any other troops in the world: nobody, that has not seen this cavalry, can have any idea to what perfection the horse rises here. The Mek has not one musket in his whole army. Besides these horse, there is a great, but uncertain number of Arabs, who pay their tribute immediately to the Mek and to the great men in government, and live under their protection close by the town, and thereby have the advantage of trading with it, of supplying it with provisions, and, no doubt, must contribute in part to its strength and defence in time of need.

The diseases of Sennaar are the dysentery, or bloody flux, fatal in proportion as it begins with the first of the rains, or the end of them, and return of the fair weather. Intermit-

ting fevers accompany this complaint very frequently, which often ends in them. Bark is a sovereign remedy in this country, and seems to be by so much the furer, that it purges on taking the first dose, and this it does almost without exception. Epilepsies and schirrous livers are likewise very frequent, owing, as is supposed, to their defeating or diminishing perspiration, or stopping the pores by constant unction, as also by the quantity of water they deluge themselves with at the time they are hottest.

The elephantiasis, so common in Abyssinia, is not known here. The small-pox is a disease not endemial in the country of Sennaar. It is sometimes twelve or fifteen years without its being known, notwithstanding the constant intercourse they have with, and merchandizes they bring from Arabia. It is likewise said this disease never broke out in Sennaar, unless in the rainy season. However, when it comes, it sweeps away a vast proportion of those that are infected: the women, both blacks and Arabs, those of the former that live in plains, like the Shillook, or inhabitants of El-aice, those of the Nuba and Guba, that live in mountains, all the various species of slaves that come from Dyre and Tegla, from time immemorial have known a species of inoculation which they call Tishteree el Jidderee, or, "the buying of the small-pox." The women are the conductors of this operation in the fairest and driest season of the year, but never at other times. Upon the first hearing of the small-pox any where, these people go to the infected place, and, wrapping a fillet of cotton cloth about the arm of the person infected, they let it remain there till they bargain with the mother how many she is to sell them. It is necessary that the terms be discussed judicially, and that the bargain be not made collusively or gratuitously, but that one piece of silver, or more, be paid for the number. This being concluded, they go home, and tie the fillet about their own child's arm; certain, as they say, from long experience, that the child infected is to do well, and not to have one more than the number of pustules that were agreed and paid for. There is no example, as far as Bruce could learn, either here or in Abyssinia, of this disease returning, that is, attacking any one person more than once.

The trade of Sennaar is not great; they have no manufactures, but the principal article of consumption is blue cotton cloth from Surat. Formerly, when the ways were open, and merchants went in caravans with safety, Indian goods were brought in quantities to Sennaar from Jidda, and then dispersed over the black country. The return was made in gold, in powder called Tibbar, civet, rhinoceros's horns, ivory, ostrich feathers, and, above all, in slaves or glass, more of which was exported from Sennaar than all the east of Africa together. But this trade is almost destroyed, so is that of the gold and ivory. However, the gold still keeps up its reputation of being the purest and best in Africa, and therefore bought at Mocha to be carried to India, where it all at last centers. If the wakea of Abyssinian gold sells at 16 patakas, the Sennaar gold sells at the same place for 22 patakas. The ivory sells at 1½ oz. *per* rotol at Cairo, which is about 25 *per cent.* lighter than the rotol of Mocha. Men-slaves, at a medium, may be about a wakea *per* head at Sennaar. There are women, however, who sell for 13 or 14 wakeas. What their peculiar excellencies may be, which so far alters the price, Bruce could not tell, only they are preferred by rich people, both Turks and Moors, to the Arab, Circassian, and Georgian women, during the warm months in summer.

The Daveina Arabs, who are great hunters, carry the ivory to Abyssinia, where they are not in fear. But no caravan

caravan comes now from Sudan (Nigritia) to Sennaar, nor from Abyffinia or Cairo. The violence of the Arabs, and the faithleffnefs of the government of Sennaar, have fhut them up on every fide but that of Jidda, whither they go once a-year by Suakem.

The wakea of Sennaar, by which they fell gold, civet, fcented oils, &c. confifts of 10 drachms; 10 of thefe wakeas make a rotol. This wakea at Sennaar is accounted the fame as that of Mafuah and Cairo. It is equal to 7 drachms 57 grains troy weight.

1 Rotol = 10 Wakeas.

1 Wakea = 10 Drachms.

But there is another wakea ufed by the merchants called the Atareys.

1 Rotol = 12 Wakeas.

1 Wakea = 12 Drachms.

But this is only ufed for coarfe goods. There is but one long meafure in Sennaar, called the Draa, which is the peek, or cubit, and is meafured from the centre of the elbow-joint to the point of the middle finger. This is probably the ancient cubit of Egypt, and of the holy fcripture. Bruce's Travels, vol. iv.

SENNAAR, a city of Africa, and capital of the kingdom of the fame name, fituated on the W. fide of the Nile, and clofe upon its banks. The ground on which it ftands rifes juft enough to prevent the river from entering the town, even in the height of the inundation, when it comes to be even with the ftreet. Poncet fays, that when he was at this city, his companion, father Brevedent, a Jefuit, an able mathematician, on the 21ft of March 1699, determined the latitude of Sennaar to be $13^{\circ} 4'$ N. the difference therefore will be about half a degree. The reader however may implicitly rely upon the fituation given it by Poncet, being the mean refult of above fifty obfervations, made both night and day, on the moft favourable occafions, by a quadrant of three feet radius, and telescopes of two, and fometimes of three feet focal length, both reflectors and refractors made by the beft mafters.

The town of Sennaar is very populous, there being in it many good houfes after the fafhion of the country. Poncet fays, in his time they were all of one ftory high; but now the great officers have all houfes of two. They have parapet roofs, which is a fingular conftruction; for in other places, within the rains, the roofs are all conical. The houfes are all built of clay, with very little ftraw mixed with it, which fufficiently fhews the rains here muft be lefs violent than to the fouthward, probably from the diftance of the mountains. However, when Poncet was there, a week of conftant rain happened, and on the 30th of July the Nile increafed violently, after loud thunder, and a great darknefs to the fouth. The whole fream was covered with wrecks of houfes, canes, wooden bowls, and platters, living camels and cattle, and feveral dead ones paffed Sennaar, hurried along by the current with great velocity. A hyæna, endeavouring to crofs before the town, was furrounded and killed by the inhabitants. The water got into the houfes that ftand upon its banks, and, by rifing feveral feet high, the walls melted, being clay, which occafioned feveral of them to fall. It feemed, by the floating wreck of houfes that appeared in the fream, to have deftroyed a great many villages to the fouthward towards Fazuëlo.

It will not be thought furprifing, confidering the latitude of Sennaar, that the heats fhould be exceffive. The thermometer rifes in the fhade to 119° . Nevertheless, from 70° to 78° Fahrenheit's thermometer, the air is cool; from 79°

to 92° temperate; at 92° it begins to be warm. N. lat. $13^{\circ} 34' 36''$. E. long. $33^{\circ} 30' 30''$. For further particulars relating to this city fee the preceding article.

SENNE, a river of France, which enters the Demer, a little below Malines.

SENNECEY, GRAND. See SENECEY.

SENNERAT, an ifland near the W. coaft of Weft Greenland. N. lat. $61^{\circ} 28'$. W. long. $47^{\circ} 35'$.

SENNERTUS, DANIEL, in *Biography*, an able and learned phyfician, was born at Breflaw, in Silefia, on the 25th of November, 1572, where his father was a fhoe-maker, and died in his childhood. He received his early education in his native city, under the direktion of his mother, and was then fent to the univerfity of Wittemberg, in the year 1593, where he exhibited fuch proofs of acutenefs of mind and folidity of judgment, that every opportunity was afforded him, by vifiting the other celebrated univerfities of Germany, efpecially thofe of Leipfic, Jena, Francfort on the Oder, and Berlin, of cultivating his talents. He returned to Wittemberg in 1601, and received the degree of doftor in September of that year, and in the fame month of the following year was appointed to a profefforfhip of medicine. In this office his eloquence and knowledge were calculated to raife him to a high reputation, and his luminous method of teaching brought crowds of pupils to his lectures. He alfo endeavoured, by means of various publications with which he enriched the profeflion among his contemporaries, to affift them in cultivating the fcience of medicine. By thefe means his reputation became fo extenfive, that patients came to him from all parts of the world, and he refufed his affiftance to nobody. He took what was offered for his trouble, but demanded nothing, and even returned to the poor what they gave him. The plague prevailed feven times at Wittemberg, while he was profeffor there; but he never retired, nor was ever known to refufe to vifit the pooreft fick. George I., elector of Saxony, whom he had cured of a dangerous illnefs in 1626, appointed him one of his phyficians in ordinary; but with the permiffion to remain at Wittemberg, that the world might continue to derive the benefit of his public inftructions. He was three times married, and had feven children by his firft wife, three of whom furvived him. He was at length carried off by an attack of the plague, which was raging in Wittemberg, in the month of July 1637, in the fixty-fifth year of his age.

Sennertus was a voluminous writer, and has been characterized, by fome critics, as a mere compiler from the works of the ancients. It is true that his writings contain an epitome, but, it muft be added, a moft comprehensive, clear, and judicious epitome, of the learning of the Greeks and Arabians, which renders them, even at this day, of confiderable value as books of reference, and which are highly creditable, confidering the age in which they were compofed, to his learning and difcrimination. The freedom, indeed, with which he impugned many of the doctines of the ancients, called up many opponents, and led him into much controverfy. He was the firft to introduce the ftudy of chemiftry into the univerfity of Wittemberg, and demonftrated his freedom from the shackles of ancient opinion, by combining much of the chemical with the Galenical doctines; an union which the mere advocates of antiquity ftrongly deprecated, as well as the introduction of chemical medicines. His treatife "De Conſentiu et Diſſenſu Galenicorum et Peripateticorum cum Chymicis," 1619, may be faid to have introduced a new feft into Germany by this union. His various works have been collected together, and published at different times and places, under the title of "Opera omnia;" but

but they were principally promulgated by himself under the following titles: "Quæstionum Medicarum controversarum Liber;" 1609. "Institutiones Medicæ, et de Origine animalium in Brutis;" 1611. "Epitome Scientiæ Naturalis;" 1618. "De Febribus Libri quatuor;" 1619. "De Scorbuto Tractatus;" 1624. "Practicæ Medicinæ Liber primus;" 1628. Five other books of the same work were successively published. "Tractatus de Arthritide;" 1631. "Epitome Institutionum Medicarum disputationibus 18 comprehensa;" 1631. "Epitome Inst. Med. et Librorum de Febribus;" 1634. "Hypomnemata physica;" 1635; and one or two small works of less note. Almost all these works have passed through many editions and translations. See Eloy Dict. Hist. de la Méd. Vita Dan. Sennerti, prefixed to his "Opera omnia."

SENNIT, (of *seven* and *kuit*), a sort of flat, braided cordage, formed by plating five or seven rope-yarns together. This is beaten smooth and flat with a hammer, and serves to keep the ropes to which it is applied from galling.

SENNONE, in *Geography*, a small island in the Mediterranean, near the coast of Naples. N. lat. $41^{\circ} 3'$. E. long. 11° .

SENO, a river which rises in the N. part of Etruria, crosses the department of the Amone, in Italy, and runs into the S. branch of the Po, between Ferrara and the Adriatic.

SENOGU, a town of New Navarre; 270 miles S.S.E. of Casa Grande.

SENOVALY, a town of Bohemia, in the circle of Rakonitz; 5 miles W.S.W. of Rakonitz.

SENONCA, a town of Naples, in Lavora; 43 miles W. of Cuma.

SENONCHES, a town of France, in the department of the Eure and Loire, and chief place of a canton, in the district of Dreux; 9 miles W. of Chateauf. The place contains 1856, and the canton 7541 inhabitants, on a territory of 205 kilometres, in 12 communes.

SENONE, a river of France, which runs into the Meurte, 5 miles S.E. of Nancy.

SENONES, a town of France, in the department of the Vosges, and chief place of a canton, in the district of St. Dié; 9 miles S.W. of Salem. The place contains 1589, and the canton 10,997 inhabitants, on a territory of 215 kilometres, in 19 communes.

SENONES, in *Ancient Geography*, a people of Gallia Celtica, who occupied nearly the whole extent of the diocese of Sens and that of Auxerre, according to the ancient divisions of France. According to Cæsar, they were confined to Belgica. This author says of them: "est civitas in primis firma, et magnæ apud Gallos auctoritatis."—Also, a people of Italy, in Gallia Cispadana, upon the borders of the Adriatic sea. Their arrival in Italy may be fixed in the year before the vulgar era 397. Having joined a leader named Aruns, who wished to avenge himself of one of the Leuce-mons in Etruria, they passed the Alps in a numerous body, and traversed the plains watered by the Po, where other Gauls were already established, and arrived on the other side of the river, in Umbria, still occupied by its ancient inhabitants. They established themselves from the Utis as far as the Æsis, having the Adriatic sea to the N.E. and the Apennines to the S.W. After having spent about six years in forming their establishments, Aruns conducted them to Clusium, to besiege that place, where his wife and her ravisher were. The Romans, whose mediation was refused, took part with the inhabitants of Clusium, and joined the troops of that city. The Senones were indignant, and de-

termined to do themselves justice. Accordingly they marched towards Rome, and penetrated into the city, in defiance of the army that was opposed to them. The Capitol made a vigorous resistance; till at length Camillus arrived, defeated the Senones, and rescued Rome. About 100 years after this expedition they engaged in a war, and were overpowered in the year of Rome 463, by M. Curius Gentulus and P. Cornelius Rufinus. They were afterwards driven from the whole country which they occupied, from the Æsis to the Rubicon. A colony was sent into their country, which assumed the name of "Senâ Gallia." Seven years afterwards they were almost entirely exterminated by Dola-bella.

SENOPLÉ. See **SINOPLÉ**.

SENORA, in *Geography*. See **SONORA**.

SENORIÆ, in *Botany*, a name by which some authors have called the banana-tree, or *musa fructu brevior*.

SENOSAD, in *Geography*, a town of Bohemia, in the circle of Czaflau; 20 miles S.S.W. of Czaflau.

SENOSECH, or **SENOSETCH**, a town of Carniola; 8 miles S.W. of Cirknitz.

SENRA, **SENREA**, or **Serra**, in *Botany*, a genus of Cavanilles, upon which different authors have bestowed the above appellations. None of these, however, seem satisfactory, for it has been suggested, that **SERREA** would be a preferable name to any of the foregoing. We are ignorant of its derivation.—Cavan. Diff. 2. 83. Willd. Sp. Pl. v. 3. 695. Juss. 274.—Class and order, *Monadelphia Decandria*. Nat. Ord. *Malvaceæ*, Juss.

Gen. Ch. Cal. Perianth double, permanent; outer of three, heart-shaped, roundish leaves; inner very small, of one leaf, cloven half way down into five segments. Cor. of five petals, malvaceous, tubular. Stam. Filaments commonly ten, united, placed on the upper superficies of the tube; anthers kidney-shaped. Pist. Germen ovate, concealed in the tube, surrounded by four membranes, or rather by a single four-toothed membrane; style simple, five-cleft. Stigma globose. Peric. Fruit ovate, downy. Seeds ten, oblong, kidney-shaped.

Ess. Ch. Calyx double; outer of three leaves; inner five-toothed. Petals five. Style five-cleft. "Capsule five-celled?"

1. *S. incana*. Cavan. Diff. 2. t. 35. f. 3. Willd.—Native of Arabia, opposite the island Socotora. The whole plant is white with down, whence its specific name. Stem scarcely three inches high, stiffish, solitary. Leaves alternate, stalked, heart-shaped, ovate, truncated, terminating with three notches. Flowers axillary, solitary, nearly sessile, probably yellowish.

Described by Cavanilles from a dried specimen, which was communicated to him by sir Joseph Banks. It appears to be allied both to *Malva* and *Gossypium*.

SENS, in *Geography*, a town of France, and principal place of a district, in the department of the Yonne, situate on the Yonne. Before the revolution it was the see of an archbishop, and contained 16 parish churches, and 14 abbeys and convents. In the reign of Edward III. and Henry V. Sens was taken by the English; 24 posts N.N.W. of Dijon. The place contains 10,600, and the canton 21,847 inhabitants, on a territory of $257\frac{1}{2}$ kilometres, in 23 communes. N. lat. $48^{\circ} 12'$. E. long. $3^{\circ} 22'$.—Also, a town of France, in the department of the Ille and Vilaine; 14 miles N.N.E. of Rennes.—Also, a town of France, in the department of the Saône and Loire; 7 miles N.N.E. of Louhans.

SENSABARY, a town of Bengal; 20 miles N. of Nulshi.

SENSAON, a town of Africa, in the kingdom of Fez, near a mountain of the same name; 25 miles S. of Tetuan.

SENSATION, in *Physiology*, a general term denoting the effect produced in the mind by the impressions of external bodies on our organs of sense, by various changes in the internal organs, and by affections of any parts of the body which possess nerves. The appropriate external objects, being presented to the eyes, ears, nose, tongue, or skin, give us the sensations of which those parts are respectively the organs: hunger and thirst, nausea and sickness, griping, fainting, agitation, &c. are the results of particular states of internal organs; fatigue is caused by exertion of the muscular system; mechanical or chemical applications to any parts possessing nerves cause pains of all kinds and degrees. Thus seeing, hearing, smelling, tasting, and touching; hunger and thirst, sickness, fainting, &c.; and all the agreeable or disagreeable effects produced by external objects acting on our frame, are so many modes of sensation, so many states of existence, accompanied each with a peculiar feeling or act of consciousness.

In the five senses, sensation requires a healthy condition of the external organs of the brain, and of the nerves which pass between the organs and the brain. The absence of either of these conditions destroys sensations: if the optic nerve be divided there is no seeing, although the eye and brain be healthy; if the brain be compressed, the nerve and the eye remaining unaffected; or if the eye be diseased, the nerve and the brain being sound, vision is destroyed. The same is the case with the general feeling of the frame: if the nerves of a limb be divided, or the brain be compressed, there is no sensation; a pin might be thrust into the part without being felt. The dependance of the internal feelings on the brain is not so clearly made out in every instance. On the whole, however, physiologists consider it as established, that sensation is the function of the nervous system. On this subject, as well as on the phenomena of sensation exhibited by the brain and nerves, we refer to *BRAIN, Physiology of the*, to *LIFE*, and *NERVOUS System*.

As there are so many different phenomena included under the common term of sensation, what is the point in which they agree? What is the character by which they are all recognized as sensations? It is the feeling excited, the consciousness of a new mode of existence, the modification which the sentient being experiences. Sensation in short is feeling.

This is the only point in which the various sensations agree; independently of this there is little resemblance, or even analogy between them. Hearing is no more like seeing, and either of these is no more like hunger or thirst, than a muscle is to a nerve or the skin.

Sensations may be reproduced without any external objects, by an active state of the brain: thus in dreams we pass through scenes, and experience feelings, which are not distinguishable from real occurrences.

Sensation, according to Dr. Reid, is a name given by philosophers to an act of mind, which may be distinguished from all others by this, that it hath no object distinct from the act itself. Pain of every kind is an uneasy sensation. The pain and the feeling, he says, are one and the same thing; and cannot be disjoined even in imagination. Pain, when it is not felt, has no existence. The same observation may be applied to every other sensation. This author adds, that when we have acquired a distinct notion of that simple act of the mind called sensation, we shall be able the more easily to distinguish it from every external object that accompanies it, and from every other act of the mind that may be conjoined with it. Hence it is of importance, that

the name of sensation should, in philosophical writings, be appropriated to signify this simple act of the mind, without including any thing more in its signification, or being applied to other purposes. The word feeling, which signifies the perceptions we have of external objects by the sense of touch, is also used to denote the same thing as sensation; in which sense it has no object, the feeling and the thing felt being one and the same. He acknowledges, however, that betwixt feeling, taken in this last sense, and sensation, there may be this small difference; that sensation is most commonly used to signify those feelings which result from our external senses and bodily appetites, and all our bodily pains and pleasures. But there are feelings of a nobler nature, accompanying our affections, our moral judgments, and our determinations in matters of taste, to which the word sensation is less properly applied.

Dr. Reid, in another place, observes, that almost all our perceptions have corresponding sensations, which constantly accompany them, and, on that account, are very apt to be confounded with them. Hence the names of most of our sensations become ambiguous, and this ambiguity hath very much perplexed philosophers. He alleges several facts that serve to illustrate and evince this ambiguity, in reference to the names we have for smells, tastes, sounds, and for the various degrees of heat and cold, which names denote both a sensation, and a quality perceived by means of that sensation. The cause is the same with respect to many operations of mind to which we give one name, and which we always consider as one thing; and yet they are complex in their nature, and made up of several more simple ingredients; of which ingredients sensation very often reckons one. Indeed, the number of our sensations and feelings is prodigious; and the most general and important division of them is into the agreeable, the disagreeable, and the indifferent.

The preceding remarks serve to evince the importance of distinguishing carefully between our sensations and that perception of external objects which is constantly conjoined with them. Sensation, says this author, taken by itself, implies neither the conception nor belief of any external object. It supposes a sentient being, and a certain manner in which that being is affected, but it supposes no more. But perception, in his view of it, implies an immediate conviction and belief of something external; something different both from the mind that perceives and from the act of perception. Things so different in their nature ought to be distinguished; but by our constitution they are always united. Every different perception is conjoined with a sensation that is proper to it. The one is the sign, the other the thing signified. They coalesce in our imagination; they are signified by one name, and are considered as one simple operation. To the philosopher it belongs to distinguish between them.

Our author elsewhere observes, that when certain impressions are made upon our organs, nerves, and brain, certain corresponding sensations are felt, and certain objects are both conceived and believed to exist. But we can neither discover the cause of any one of these operations, nor any necessary connection of one with another.

On the subject of this article, in its connection with metaphysics, or the philosophy of the human mind, we refer to *IDEA*, *PERCEPTION*, *Mental PHILOSOPHY*, *VIBRATION*, and other terms of a similar import, or in any degree connected with them, occurring in various parts of the *Cyclopædia*.

SENSBURG, in *Geography*, a town of Prussia, in the province of Bartenland; 14 miles S. of Rastenburg. N. lat. 53° 44'. E. long. 21° 23'.

SENSE. SENSES, in *Physiology* and *Anatomy*, the organs

gans by which we become acquainted with surrounding objects, by which external bodies impress our frame, so as to communicate to us a knowledge of their properties. They are five in number, *viz.* the eyes, ears, nose, tongue, and skin; for the anatomical and physiological account of which, we refer to these articles. These are often called the *external senses*; while the internal organs, the parts of the brain which are concerned in knowing and reflecting, have sometimes been called the *internal senses*. See *Mental Philosophy*.

Dr. Hutcheson gives us a more extensive and philosophical notion of sense. On his principle, sense is defined, a power of perception, or a power of perceiving ideas; at least if what is absolutely passive may be properly called a power.

On some occasions, instead of power, he chuses to call it a determination of the mind to receive ideas; and the ideas thus perceived, or raised in the mind, he calls *sensations*.

Sense, he considers, either as natural or moral; and the natural, either as external or internal: though the distribution is chiefly founded on the common ways of conceiving; for, in reality, they appear to be all natural and necessary. Some reasons, however, for the distinction, will be shewn under the several articles of it.

External senses, then, are powers of perceiving ideas, upon the presence of external objects. On such occasions, we find the mind is merely passive, and has not power directly to prevent the perception, or idea, or to vary it at its reception; as long as the body is continued in a state fit to be acted upon by the external object.

When two perceptions are entirely different from each other, or agree in nothing but the general idea of sensation, the powers of receiving those different perceptions are called *different senses*. Thus, seeing and hearing denote the different powers of receiving, *ie* ideas of colours and sounds. And though colours, as well as sounds, have vast differences amongst themselves; yet is there a greater agreement among the most opposite colours, than between any colour and a sound; and hence all colours are deemed perceptions of the same sense.

All the several senses seem to have their distinct organs, except feeling, which is, in some degree, diffused over the whole body. Inquiry into the Original of our Ideas of Beauty and Virtue, p. 2. 8vo. 1726.

In another place, the same writer defines the external senses to be those determinations of nature, by which certain perceptions constantly arise in the mind, when certain impressions are made upon the organs of the body, or motions raised in them. Some of these perceptions are received solely by one sense; others may be received by two or more. Of the former class are these five sorts; *viz.* colours, sounds, tastes, smells, cold, or heat. Some ingenious authors reckon more: these we may call the proper ideas of sensation. *System of Moral Philosophy*, vol. i. p. 4.

Internal senses are powers or determinations of the mind to be pleased with certain forms and ideas, which occur to our observation, in objects perceived by the external senses. Of these there are two different species, distinguished by the different objects of pleasure, *viz.* pleasurable or beautiful forms of natural things, and pleasurable or beautiful actions, or characters of rational agents: whence the internal senses become divisible into natural and moral; though what others call the *internal natural sense*, our author calls simply, and by way of eminence, the *internal sense*.

In reflecting on our external senses, we plainly see, that our perceptions of pleasure and pain do not depend directly on our will. Objects do not please us, according as we in-

cline they should: the presence of some objects necessarily pleases us, and the presence of others as necessarily displeases us; nor can we by our will any otherwise procure pleasure, or avoid pain, than by procuring the former kind of objects, and avoiding the latter. By the very frame of our nature, the one is made the occasion of delight, and the other of dissatisfaction. In effect, our sensitive perceptions are pleasant, and painful, immediately, and without any knowledge of the cause of this pleasure and pain, or of the manner how they excite it, or are occasions of it, or without our seeing to what farther advantage, or detriment, the use of such objects might tend. Nor would the most accurate knowledge of these things vary either the pleasure, or the pain, of the perception: however it might give a rational pleasure, distinct from the sensible; or might raise a distinct joy, from prospect of farther advantage in the object, or another aversion, from apprehension of evil. There is scarcely any object which our minds are employed about, but is constituted the necessary occasion of some pleasure or pain. Thus, we shall find ourselves pleased with a regular form, a piece of architecture, or painting, a composition of notes, a theorem, an action, an affection, a character; and we are conscious, that this pleasure naturally arises from the contemplation of the idea then present to the mind, with all its circumstances, though some of those ideas have nothing of what we call sensible perception in them; and in those which have, the pleasure arises from some uniformity, order, arrangement, and imitation; and not from the simple ideas of colour, or sound, or mode of extension, separately considered.

It seems hence to follow, that when instruction, education, or prejudice of any kind, raise any desire or aversion towards an object; this desire, or aversion, is founded on an opinion of some perfection, or deficiency, in those qualities, for perception of which we have the proper senses. Thus, if beauty be desired by one who has not the sense of sight; the desire must be raised by some apprehended regularity of figure, sweetness of voice, smoothness, softness, or some other quality, perceivable by the other senses, without relation to the ideas of colour.

The only pleasure of sense, which our philosophers seem to consider, is that which accompanies the simple ideas of sensation; but there are vastly greater pleasures in those complex ideas of objects, which obtain the names of beautiful and harmonious. The power, then, by which we receive ideas of beauty and harmony, has all the characters of a sense. It is no matter, whether we call these ideas of beauty and harmony, perceptions of the external senses of seeing and hearing, or not: we should rather choose to call these ideas an internal sense, were it only for the convenience of distinguishing them from other sensations of seeing and hearing, which men may have without perception of beauty and harmony. Hutcheson's Inquiry, &c. Preface, and p. 3, &c.

For the general manner in which our senses act, or, more properly, the manner in which we become sensible, that is, perceive external objects, see SENSATION.

For the particular senses, or, more properly, the particular manner in which we become sensible, by the particular organs of sense, see HEARING, SEEING, SMELLING, &c.

For the several organs of sense, ministering to the several manners of sensation, see EYE, EAR, NOSE, &c.

Pliny observes, that of all the senses, feeling and tasting are those which man enjoys in the greatest perfection. As to seeing, he says, he is excelled by the eagle, &c.; as to smelling, by the vulture, &c.; and as to hearing, by the mole, even when hid under ground.

The senses have been sometimes found greatly sharpened and improved by diseases. Mr. Boyle mentions a gentleman, who, during a distemper he had in his eyes, had his organs of sight brought to be so sensible, that when he waked in the night, he could, for a while, plainly see and distinguish colours, and other objects; and the same author gives an instance of another person, who, after getting half-fuddled with claret, if he waked in the night, could see for some time to read a moderate print.

Grimaldi tells us, that some women of Megara were able by their eyes alone to distinguish between eggs laid by black hens, and those by white ones. Grimald. de Lum. & Col.

In the Philosophical Transactions, N^o 312, we have an account of Dan. Frazer, who continued deaf and dumb from his birth to the seventeenth year of his age; when, upon recovering from a fever, he perceived an uneasy motion in his brain, after which he began to hear, and by degrees to speak.

Dr. Reid, in his second Essay, suggests a variety of methods, by which our senses may be improved, as they give us information of things that concern us. Our original powers of perceiving objects by our senses admit of great improvement by use and habit; but, besides, there are various ways in which our senses may be improved, or their defects remedied by art; as by a due care of the organs of sense, that they be in a sound and natural state; by accurate attention to the objects of sense; by additional organs or instruments contrived by art; and by discovering the connection which nature has established between the sensible qualities of objects, and their more latent qualities.

Dr. Reid suggests, that the fallacy of the senses has been a common complaint among philosophers, both ancient and modern; and this, he thinks, is founded on a common error, to which another has been added, that our use of reason is to detect the fallacies of sense. In his opinion, there is no more reason to account our senses fallacious, than our reason, our memory, or any other faculty of judging which nature hath given us. They are all limited and imperfect, but wisely suited to the present condition of man. We are liable to error and wrong judgment in the use of them all, but as little in the information of sense as in the deductions of reasoning; and the errors we fall into, with regard to objects of sense, are not corrected by reason, but by more accurate attention to the information we may receive by our senses themselves.

SENSE, *Moral*, is a determination of the mind to be pleased with the contemplation of those affections, actions, or characters, of rational agents, which we call *good* or *virtuous*.

This moral sense of beauty in actions and affections, may appear strange at first view; some of our moralists themselves are offended at it in lord Shaftesbury, as being accustomed to deduce every approbation, or aversion, from rational views of interest. Our gentlemen of good taste can tell us of a great many senses, tastes, and relishes for beauty, harmony, imitation in painting and poetry; and may we not find, too, in mankind a relish for a beauty in characters, in manners? The truth is, human nature does not seem to have been left quite indifferent in the affair of virtue, to form to itself observations concerning the advantage or disadvantage of actions, and accordingly to regulate its conduct. The weakness of our reason, and the avocations arising from the infirmities and necessities of our nature, are so great, that very few of mankind could have framed those long deductions of reason, which may shew some actions to be, in the whole, advantageous, and their contraries pernicious.

The Author of nature has much better furnished us for a virtuous conduct than our moralists seem to imagine; by almost as quick and powerful instructions, as we have for the preservation of our bodies: he has made virtue a lovely form, to excite our pursuit of it; and has given us strong affections, to be the springs of each virtuous action. Hutcheson's Inquiry, &c. ubi supra. Essay on the Nature and Conduct of the Passions, p. 5, &c. See *Mental and Moral PHILOSOPHY*, and also *VIRTUE*.

SENSE, *Public*, is defined by the same author to be our determination to be pleased with the happiness of others, and to be uneasy at their misery. This, he says, is found in some degree in all men, and was sometimes called *κοινωνικισμους*, or *sensus communis*, by some of the ancients.

SENSE, *Common*, is a term that has been variously used both by ancient and modern writers. With some it has been synonymous with public sense; with others it has denoted prudence; in certain instances it has been confounded with some of the powers of taste; and, accordingly, those who commit egregious blunders with regard to decorum, saying and doing what is offensive to their company, and inconsistent with their own character, have been charged with a defect in common sense. Some men are distinguished by an uncommon acuteness in discovering the characters of others; and this talent has been sometimes called common sense: similar to which is that use of the term, which makes it to signify that experience and knowledge of life which is acquired by living in society. Hor. lib. 1. sat. 3. lin. 66. To this meaning Quintilian refers, speaking of the advantages of a public education: "Sensum ipsum qui communis dicitur, ubi discet, cum se a congressu, qui non hominibus solum, sed mutis quoque animalibus naturalis est, segregarit?" Lib. 1. cap. 1.

Dr. Reid observes, in his 6th Essay, "of Common Sense," that, in common language, sense always implies judgment, nor is the popular meaning of the word sense peculiar to the English language: the corresponding words in Greek, Latin, and probably in all the European languages, have the same latitude. The Latin words *sentere*, *sententia*, *sensa*, *sensus*, from the last of which the English word sense is borrowed, express judgment or opinion, and are applied indifferently to objects of external sense, of taste, of morals, and of understanding.

This is the meaning which Mr. Pope has given to it; and in his epistle to the earl of Burlington he has thus descanted upon it:

"Oft have you hinted to your brother peer,
A certain truth, which many buy too dear;
Something there is more needful than expence,
And something previous ev'n to taste—'tis Sense.
Good sense, which only is the gift of Heaven;
And though no science, fairly worth the seven:
A light, which in yourself you must perceive,
JONES and LE NOTRE have it not to give."

Having shewn that sense, in its most common, and therefore most proper meaning, signifies judgment, our author infers that common sense should mean common judgment; as it really does.

Lord Shaftesbury has given to one of his treatises the title of "*Sensus Communis*;" and he has introduced some criticism upon this word in Juvenal, Horace, and Seneca: after shewing in his facetious manner, that the fundamental principles of morals, of politics, of criticism, and of every branch of knowledge, are the dictates of common sense, he sums up the whole in these words; "that some moral and philosophical truths are so evident in themselves, that it would

would be easier to imagine half mankind run mad, and joined precisely in the same species of folly, than to admit any thing as truth, which should be advanced against such natural knowledge, fundamental reason, and common sense;" and on taking leave he adds; "and now, my friend, should you find I had moralised in any tolerable manner, according to common sense, and without canting, I shall be satisfied with my performance." After citing other numerous testimonies in vindication of common sense, as a principle of knowledge, our author concludes with observing, that it is absurd to conceive that there can be any opposition between reason and common sense. To reason we ascribe two offices, or two degrees. The first is to judge of things self-evident; the second to draw conclusions that are not self-evident from those that are: the first of these is the province, and the sole province, of common sense; and therefore it coincides with reason in its whole extent, and is only another name for one branch or degree of reason. The first is purely the gift of heaven; the second is learned by practice and rules, when the first is not wanting.

Our author further observes, that the province of common sense is more extensive in refutation than in confirmation. A conclusion drawn by a train of just reasoning from true principles, cannot possibly contradict any decision of common sense, because truth will always be consistent with itself. Neither can such a conclusion receive any confirmation from common sense, because it is not within its jurisdiction. But it is possible that, by setting out from false principles, or by an error in reasoning, a man may be led to a conclusion that contradicts the decisions of common sense. In this case, the conclusion is within the jurisdiction of common sense, though the reasoning on which it was grounded be not; and a man of common sense may fairly reject the conclusion, without being able to shew the error of the reasoning that led to it.

After these preliminary remarks, we observe that the term *common sense* hath in modern times been used to signify that power of the mind which perceives truth, or commands belief, not by progressive argumentation, but by an instantaneous, instinctive, and irresistible impulse; derived neither from education nor from habit, but from nature; acting independently of our will, whenever its object is presented, according to an established law, and, therefore, called *sense*; and acting in a similar manner upon all, or at least upon a great majority of mankind, and, therefore, called *common sense*. The first among the moderns who took notice of this principle as one of the springs of our knowledge, was Buffier, a French philosopher of the last century, in a book entitled "*Traité des Premières Veritez*;" and this doctrine hath lately, in our own country, been illustrated and maintained by Drs. Reid, Beattie, Osvald, and Campbell.

In order to evince that there is a real and essential difference between this faculty and that of reason, it is observed, that we are conscious, from internal feeling, that the energy of understanding, which perceives intuitive truth, is different from that other energy which unites a conclusion with a first principle, by a gradual chain of intermediate relations; that we cannot discern any necessary connection between reason and common sense; that the one is more in our power than the other; the faculty of reasoning being improveable by culture, whereas common sense, like other instincts, arrives at maturity with almost no care of ours, and it is impossible to teach common sense to one who wants it; though this, like other instincts, may languish for want of exercise; and that a distinction, similar to that which is here maintained, is acknowledged by the vulgar, who speak of mother-wit as something different from the deductions of

reason, and the refinements of science. All sound reasoning, it is said, must ultimately rest on the principles of common sense; that is, on principles intuitively certain, or intuitively probable; and, consequently, common sense is the ultimate judge of truth, to which reason must continually act in subordination. Thus the advocates for this faculty, as an original and distinct power of the human mind, assign to it a very extensive empire, and an authority that is supreme and absolute. And they have proceeded so far as to substitute, in the room of Mr. Locke's abstraction, this faculty as the characteristic of rationality. To this they refer the evidence of mathematical truth, of external and internal sense, of memory, of reasoning from the effect to the cause, of probable or experimental reasoning, of analogical reasoning, of faith in testimony, and, indeed, of all primary truths. To common sense, therefore, all truth must be conformable: this, they say, is its fixed and invariable standard. And whatever contradicts common sense, or is inconsistent with that standard, though supported by arguments that are deemed unanswerable, and by names that are celebrated by all the critics, academics, and potentates on earth, is not truth, but falsehood. In a word, the dictates of common sense are, in respect to human knowledge in general, what the axioms of geometry are in respect to mathematics: on the supposition that these axioms are false or dubious, all mathematical reasoning falls to the ground; and on the supposition that the dictates of common sense are erroneous or deceitful, all truth, virtue, and science, are vain. And hence it appears, that, according to this system, common sense is not only the test of truth, but the standard of moral obligation.

Dr. Priestley, in his attack upon this system, has charged the abettors of it with an unnecessary innovation in the received use of a term; as no person ever denied that there are self-evident truths, and that these must be assumed as the foundation of all reasoning. But they also recommend particular positions as axioms, not as being founded on the perception of the agreement or disagreement of any ideas, which is the great doctrine of Mr. Locke, and which makes truth to depend upon the necessary nature of things, to be absolute, unchangeable, and everlasting; but merely some unaccountable instinctive persuasions, depending upon the arbitrary constitution of our nature, which makes all truth to be a thing that is relative to ourselves only, and consequently to be infinitely vague and precarious. This system, he says, admits of no appeal to reason, properly considered, which any person might be at liberty to examine and discuss; but, on the contrary, every man is taught to think himself authorized to pronounce decisively upon every question, according to his present feeling and persuasion; under the notion of its being something original, instinctive, ultimate, and incontrovertible, though, if strictly analysed, it might appear to be a mere prejudice, the offspring of mistake. Some of the maxims which they have adopted as self-evident truths, and which they have multiplied without necessity, are so far from being self-evident, that, in the judgment of many sober and candid enquirers after truth, they are not true, but capable of a satisfactory refutation.

At the same time, since no man can pretend to any natural right to fix the principles of faith for another, they teach unbelievers, and by their example authorize them, to reject the principles of religion by the same summary and superficial process, as what appear to them to be, at first sight, too absurd and ridiculous to be admitted as true and divine.

Dr. Priestley apprehends, that the inconveniences above-mentioned, may attend even the calling of that faculty by which we discern truth by the name of *sense*. By this term, philosophers

philosophers in general have denominated those faculties, in consequence of which we are liable to feelings relatively to ourselves only, and from which they have not pretended to draw any conclusions concerning the nature of things; whereas truth is a thing not relative, but absolute and real, independent of any relation to this or that particular being, or this or that order of beings. Besides, if the determinations of this new principle of common sense be so instantaneous, irresistible, and infallible, as Dr. Reid, Dr. Beattie, and Dr. Oswald represent, how can we account for all the error there is in the world? Not to add, that this system, in its practical influence, tends to prevent the exercise of free and unrestricted enquiry, with regard either to truth or duty; and to promote, in many cases, the extravagancies of credulity, enthusiasm, and mysticism. Dr. Priestley also observes, that Dr. Price (in his *Review of the Principal Questions and Difficulties in Morals*, 8vo.) though unnoticed by the writers above cited, by maintaining that the understanding is the source of many of our most important simple ideas (see *IDEA*), has secured all the flattering advantages of the new doctrine of common sense, without the capital inconveniences attending it. Like this system, his scheme cuts off, if it be admitted, all objections to primary moral truths, resting them on a simple appeal to the faculty of intuition; and refusing to reason upon a subject, which is maintained to be as evident as the truth of the geometrical axiom, that if equal things be taken from equal things, the remainders will be equal.

If the ideas of moral right and wrong, &c. be perceived by a sense, it depends upon our arbitrary constitution, that we conceive of them as we do, or whether we perceive them at all; and we have no method whatever of investigating, whether they have any foundation in the absolute nature of things; whereas by making moral ideas the object of the understanding as such, the principles of morality become part of this system of necessary, eternal, and unalterable truth, perceived by the divine Being as by ourselves, but altogether independent of his will, as well as of all other beings and things whatsoever; as much so as the truth of the axiom above-mentioned, or of the proposition, that two and two make four.

It is added, that these writers seem even to have borrowed their language, as well as their ideas, from Dr. Price, who also uses the term common sense, though applied in a different manner. Reid's *Enquiry into the Human Mind on the Principles of Common Sense*, 8vo. ed. 2. 1765. Reid's *Essays*, above cited. Beattie's *Essay on the Nature and Immutability of Truth*, 8vo. ed. 2. 1771. Oswald's *Appeal to Common Sense in behalf of Religion*, 8vo. ed. 2. 1768. Campbell's *Philosophy of Rhetoric*, 8vo. 1776, vol. i. p. 109, &c. Priestley's *Examination of Reid, Beattie, and Oswald*, &c. 8vo. 1774. For a farther account of this system, see *ABSTRACTION* and *IDEA*.

SENSEN, in *Geography*. See *SENGEN*.

SENSIBILITY, in *Physiology*, the power of receiving an impression, and transmitting it to the brain, so as to cause sensation or feeling. The question whether any part be sensible is, therefore, whether by acting on it in any way, feeling can be excited. Sensibility in this, its common acceptation, obviously refers to the internal feeling or act of consciousness resulting from its exercise. Some physiologists have used the word in a more extensive sense, to denote all impressions produced on our organs, even those which are not felt; as that of the blood on the heart, the food on the alimentary canal, &c. They call the former *animal* sensibility, because it is peculiar to living beings; and they distinguish the latter by the name *organic*, as it belongs to those

parts where motions are involuntary, and which constitute the automatic or organic life. See *LIFE*.

Roussseau has given the word sensibility a place among French musical technica. The soul of the composer should furnish ideas, the performer should be gifted with feeling in their expression, and the audience should be capable of being impressed with the beauties and defects of the music which is executed for their amusement.

SENSIBLE *Horizon, Point, and Qualities*. See the substantives.

SENSIBLE *Note*. See *NOTE, Sensible*.

SENSITIVE FLUID. Some have imagined a sensitive fluid as the principle that preserves animals from corruption, and to which we owe our sensation and motion. This animal fluid passes in the proper nervous tubes to the organs of motion; but is contained in the fibrous coats of the nerves to become an organ of sensation. This sensitive fluid is, according to M. Le Cat, capable of thinking, and is so modified by the ganglions, that what is lodged in each part, is capable of being impressed by the object proper to each organ. And from the doctrine concerning this animal fluid, he endeavours to account for most operations, which are generally said to depend on the soul. (*Med. Ess. Edinb. Abridg.* vol. ii. p. 481.) But all these attempts to account for sensation and thought, from the properties of matter, seem to be very desperate undertakings, not to say absurd.

SENSITIVE Plant, in *Botany*. See *MIMOSA*.

The sensitive plant is sufficiently known to the world for its remarkable property of receding from the touch, and giving signs, as it were, of animal life. Philosophers in general have, however, contented themselves with admiring the fact, without giving themselves any trouble about the cause. See *LEAF*.

Mr. Hook, indeed, has made some conjectures about it; but the greatest light that has been given into the thing, is from the inquiries which Messrs. Du Fay and Du Hamel, gentlemen of the Academy of Sciences at Paris, concerted together, and afterwards made separately on different shrubs, or at different times, that each might be able to correct the errors of the other.

Botanic writers mention many kinds of sensitive plants, some of which contract at a touch, others with heat, others with cold. The truth is, many, if not most, vegetables expand their flowers, down, &c. in warm sun-shiny weather, and again close them towards evening, or in rain, &c. especially at the beginning of flowering, or after the flowers are fallen, whilst the seed is yet young and tender; as is very evident in the down of dandelion, &c. and in the flower of the pimpernel, the opening and shutting of which are the countryman's weather-wiser; by which, Gerarde says, he foretels what weather shall follow the next day; for if the flowers be close shut up, it betokens rain and foul weather; if they be spread abroad, fair weather.

The structure of the sensitive plant is this; from the large stems, or main branches of the whole, there part off several other lesser ones, and from these there go off others still less, which, by way of distinction, may be called the ribs of the leaves, as they serve to support a number of leaves arranged on each side, and standing on short pedicles in pairs, over against one another. Several other plants have this sort of compound leaves, as the cassia, colutea, and the like; and all these shut their leaves together at night, and open them again in the morning, in the same manner as the sensitive plant does. This periodical opening and shutting of the leaves are therefore common to many plants, not peculiar to the sensitive plant; but the wonder in this is, that beside having this motion periodical and regular, it is to be brought on

on at other times, and by accidents, there requiring no more than the touching of the plant to make it close its leaves at any time of the day, which it soon afterwards naturally opens again. This is peculiar to this plant, and resembles the action of an animal which had been injured or frightened. A close observation also of the manner in which this is performed, will give many hints towards the finding of its cause.

It is a very difficult thing to touch the leaf of a vigorous sensitive plant so lightly, as not to make it close; its sensation is extremely delicate, and its large rib or nerve, which runs along its middle, is as it were a hinge, on which the two halves of the leaf move when they turn upon being touched, till they stand erect, and by that means meet one another.

The slightest touch imaginable gives this motion to the side of the leaf which is touched, which is communicated immediately to the other side, or half, and they move together; and if the touch has been a very little rougher, the opposite leaf on the same rib receives the impression, and closes up in the same manner with that which was actually touched.

Nor is this all, for when the two sides of each of these leaves move upwards, the pedicle of each half moves upwards at the same time, and by this means they, in some measure, approach towards each other, and make the angles of their pedicles with the main rib, or stalk of the composite leaf, less than before; and the total motion of each leaf is composed of these two motions.

If the touch be still rougher, the whole arrangement of leaves on the same rib feels its influence on each side, and all close in the same manner with the single pair in the preceding instance; and if the touch be yet stronger than this, the rib itself feels it, and attempts to close in its way; moving itself upwards towards the branch from which it is produced, just as the single pedicles of the leaves did towards it: and if the touch be yet more hard and rough, the very branches have the sensation propagated to them, and apply themselves to the main stem, or trunk of the shrub, as the simple leaves did before to their rib, and that rib to the branch; so that the whole plant in this state forms itself from a very complexly branched figure, into a sort of straight cylindric one. That motion which has, of all others, the greatest effect upon this plant, is a shaking one.

These three motions of the plant are performed by means of three distinct and sensible articulations; the first that of the single leaf to its pedicle, the second that of the pedicle to its branch, the third that of the branch to the trunk. The primary motion of all which, is the closing of the two halves of the leaf upon their rib, which ought also to be performed in a similar manner, and by a similar articulation; this, however, is much less visible than the others.

These motions are wholly independent of one another, as may be proved by experiment. It should appear, that if the stalks are moved, and collapse towards the branches, or these towards the trunk, that the leaves, whose motion is usually primary to these, should be affected also; yet experiment proves, that it is possible to touch the branches in such a manner, as to affect them only, and make them apply themselves to the trunk, while the leaves feel nothing of the touch; but this cannot be, unless the branches are so disposed, as that they can fall to the trunk without suffering their leaves to touch any other part of the plant in their passage, because, if they do, they immediately become affected.

Winds and heavy rains cause the sensitive plants to shut up their leaves, while easy showers do not at all affect them; it is plain hence, that the agitation of the plant by the wind, and the strokes given by the large and heavy drops of rain, are what cause the contraction.

By whatever accident the plant has been made to close its leaves, it always regularly opens them again afterwards. This, however, requires different times, according to several circumstances, as the time of the day, the season of the year, and the more and less vigorous and healthy state of the plant; sometimes this is done in ten minutes, sometimes it requires half an hour; and the manner is not less different than the time, for sometimes the leaves unfold themselves first, and sometimes the branches, whereas sometimes all is done at once, and the whole plant seems in motion at a time.

In endeavouring to account for the motions of this plant, the gentlemen above named have conjectured that they are performed by means of a sort of very nice and fine hinges, which communicate one with another by means of very minute and slender cords, which occasion them to act as we see when the plant is sufficiently disturbed, and these cords shaken; and what gives a strong probability to this conjecture is, that the decayed and dying leaves of the plant perform this motion as regularly and vigorously, as those which are fresh and full of juice.

It seems plain, that while the juices are evaporating, and the parenchymatous substance of the leaves drying up, these more solid parts, the lines and cordages, retain their figure; and, consequently, if it is by means of these that the motion is always performed, it will be as well performed in these as in the fresher leaves, which could not be the case were it owing to the juices.

The natural opening and shutting of the leaves of this plant at night and morning, are not so fixed but that they are variable also, according to circumstances of place, temperature, &c.

In the month of August, a sensitive plant was carried in a pot out of its usual place into a dark cave, the motion that it received in the carriage shut up its leaves, and they did not open till twenty-four hours afterwards; at this time they became moderately open, but were afterwards subject to no changes at night or morning, but remained three days and nights with their leaves in the same moderately open state. At the end of this time they were brought out again in the air, and then recovered their natural periodical motions, shutting every night and opening every morning, as naturally and as strongly, as if it had not been in this forced state; and while in the cave, it was observed to be very little less affected with the touch than when abroad in the open air.

Repeated experiments have proved, say these philosophers, that it is not the light of the day that opens the leaves of this plant, nor the darkness of the night that closes them; neither is it the alternate warmth of the day and cold of the night, that have this effect, since it shuts in nights which are much warmer than the days often are in which it opens; and the increasing the heat of the place in which it is kept, and marking the increase or decrease on the thermometer, have been found to have not the least effect, as to its sooner or later opening or shutting its leaves.

The most probable conjecture seems, that it is not great heat, or great cold, such as it can bear, that bring on this effect, but the sudden change from one to the other, and this is confirmed by this experiment, that if one of these plants be raised under a glass bell, or case, and the bell or covering be taken off, it immediately closes, even though it be in the middle of the day; and this is also observed, that the more open or exposed the plant stands, the more strong and lively are its shutting and opening; and that they are most observable in summer, and much less so when it is kept in a close stove in winter.

The great heats of summer, when there is open sunshine at noon, affect the plant in some degree like cold, causing it to shut

shut up its leaves a little, but never in any very great degree. The plant, however, is least of all affected about nine o'clock in the morning, and that is consequently the properest time to make experiments on it. A branch of the sensitive plant cut off, and laid by, retains yet its property of shutting up and opening in the morning for some days; and it holds it longer if kept with one end in water than if left to dry more suddenly.

The leaves only of the sensitive plant shut up in the night, not the branches; and if it be touched at this time, the branches are affected in the same manner as in the day, shutting up, or approaching to the stalk or trunk, in the same manner, and often with more force. It is of no consequence what the substance is with which the plant is touched, it answers alike to all; but there may be observed a little spot, distinguishable by its paler colour in the articulations of its leaves, where the greatest and nicest sensibility is evidently placed.

The sensitive plant plunged into water immediately closes its leaves, which is partly owing to the touch, partly to the coldness of the water; afterwards the leaves expand again, and if they are then touched, close again as before, as if in the open air, only that they do it with less force.

If the end of one of the leaves be burning with the flame of a candle, or by a burning glass, or touching it with hot iron, it closes up in a moment, and the opposite leaf does the same, and after that the whole series of leaves on each of the rib, then the rib itself, then the branch, all do the same, if the burning has been in a sufficient degree. This proves that there is a very nice communication between all the parts of the plant, by means of which the burning, which only is applied to the extremity of one leaf, diffuses its influence through every part of the shrub.

If a drop of aqua fortis be carefully laid upon a leaf of the sensitive plant, so as not to shake it in the least, the leaf does not begin to move till the acid liquor corrodes the substance of it; but at that time, not only that particular leaf, but all the leaves placed on the same rib, close themselves up. The vapour of burning sulphur has also this effect on many leaves at once, according as they are more or less exposed to it; but a bottle of very acrid and sulphureous spirit of vitriol, placed under the branches unstopped, produces no such effect.

The wetting of the leaves with spirit of wine has been observed also to have no effect, nor the rubbing oil of almonds over them; though this last application destroys many plants.

A branch of the plant was cut away longitudinally, till only a third part of the substance remained, yet it communicated the effects of the touch, in the same manner as before, to those branches which arose lower on the shrub. The transpiration of the plant being retarded, is of no effect as to its periodical opening and closing; for one kept under a close glass bell shuts and opens as regularly night and morning, as when it stands in an open green-house. A branch of it put into the exhausted receiver of an air-pump, is found to have its force of opening and closing up much impaired, but not wholly taken off. *Mém. de l'Acad. des Scienc. Par. 1736.*

Dr. Hill, notwithstanding the experiments and observations above recited, considers the phenomenon of the sensitive plant as the effect of light, and in an express dissertation on this subject, endeavours to account for it from this principle; ascribing that other phenomenon, which is called the sleep of plants, to the absence of light. Hill's *Sleep of Plants, and the Cause of Motion in the Sensitive Plant explained*, 12mo.

Mr. Ellis has described a sensitive plant, which is a native of the swamps in North Carolina, called *dionea muscipula*, or *Venus's fly-trap*, (see *DIONEÆ*.) and which, from his account of it, appears to be the most animated of the whole sensitive tribe of vegetables. Its sensibility exists in its leaves, each of which exhibits, in miniature, the figure of a rat-trap with teeth closing on every fly or other insect that is tempted to taste the sweet liquor which is supposed to be secreted in certain minute red glands that cover its inner surface; but before it has had time to taste it, the lobes of the leaves rise up, and inclose and grasp the invader, and he is soon deprived of his life by the action of three small erect spines, fixed near the middle of each lobe; nor do the leaves open again while the dead animal continues there. The same effect is produced by a straw or pin.

Mr. Ellis conjectures, that in the construction and motive powers of this plant, nature may have had some view to its nourishment, by forming the upper joint of each leaf like a machine to catch food, and by having laid a bait upon the middle of it, to entice the unhappy insect that becomes its prey. But, perhaps, it may be equally probable, that nature has armed and animated this plant for the preservation of its juices against the depredation of insects. Ellis's *Directions for bringing over Seeds and Plants, &c. 1770.*

SENSITIVE Plant, Ballard. See *ÆSCHYNOMENE*.

SENSITIVE Power. See *Mental PHILOSOPHY*.

SENSITIVE or Sensible soul, the soul of brutes, or that which man is supposed to have in common with brutes. See *BRUTE*.

It is thus called, either as intimating its utmost faculty to be that of sensation; or, perhaps, because it is supposed to be material, and to come under our senses.

Lord Bacon asserts, that the sensible or brute soul is plainly no more than a corporeal substance, attenuated by heat, and thus rendered indivisible; or a kind of aura or vapour, partly of an aerial, and partly of a fiery nature, endued with the softness of air, to be fit to receive impressions, and with the vigour of fire to communicate its action; fed partly with oily matters, and partly with aqueous ones inclosed in the body, and, in the more perfect animals, principally in the head, moving along the nerves, and restored and repaired by the spirituous blood of the arteries. *Bac. de Augment. Scient. lib. v. See LIFE.*

SENSKOWA, in *Geography*, a town of Prussia, in the palatinate of Culm; 15 miles N.E. of Thorn.

SENSORIUM, in *Physiology*, the part which feels and perceives, the common centre, to which sensations are conveyed, and from which volition emanates; in other words, the brain. In medical and physiological writings, this expression is used as synonymous with brain; thus we read of affections of the sensorium; of sensorial power and influence, &c. *Sensorium commune*, is the imaginary point of the brain, the residence of the metaphysical soul, to which every sensation is brought, and from which all determinations of the will proceed. The speculations on this subject have been founded in the assumed unity of the soul. Physiologically speaking, there is not the slightest ground for supposing such a part to exist in the brain. Our remarks on the functions of the brain and parts connected with it, will be found under the articles *BRAIN*, *LIFE*, and *NERVOUS System*. See also *Mental PHILOSOPHY*.

Sir Isaac Newton considers the universe as the sensorium of the godhead.

SENTELIUS, LODOVICUS, in *Biography*, a disciple of Henry Isaac, and in 1530 appointed chapel-master to the duke of Bavaria. Many of his compositions are inserted in the *Dodecachordon* of Glareanus, with great encomiums.

He

He was in high favour with Martin Luther, a good judge of music; and Sebaldus Hayden, in 1540, calls him the prince of German musicians.

SENTENCE, in *Law*, *doom*; a judgment passed in court by the judge upon some process either civil or criminal.

Sentences are either *definitive*, which put an end to the suit and controversy, and regard the principal matter in question; or *interlocutory*, which determine only some incidental matter; *contradictory*, &c.

There are sentences of absolution, excommunication, &c.

Superior judges may either confirm or annul the sentences of inferior ones.

Every sentence must be in writing, on a stamp, and it must be pronounced in the presence of both parties; otherwise sentence given in absence of one of the parties is void.

SENTENCES, *Three conformable, tres sententia conformes*. In the Romish *Ecclesiastical Law*, it is allowed to appeal three times; so that there must be *three conformable sentences* before the decisions of the judges can take effect. The first degree of jurisdiction is in the bishop's official; from him an appeal lies to the metropolitan, from the metropolitan to the primate, or immediately to the pope. If the appeal come from the metropolitan to the pope, the pope is obliged to delegate judges in *partibus*; and then if the three sentences passed in these three stages be *conformable*, there is no farther appeal; but if one of them annul another, new judges are to be required of the pope for a fourth sentence; and thus they sometimes proceed to a sixth or seventh sentence.

This number of jurisdictions is found infinitely prejudicial to the public, and vexatious to private persons.

SENTENCE, in *Grammar*, denotes a period, or a set of words comprehending some perfect sense or sentiment of mind.

Every sentence comprehends at least two words.

Mr. Harris, in his *Hermes*, p. 17, &c. considering that the leading powers of the soul are those of perception and volition, observes, that every sentence, in reference to these powers, will be either a sentence of assertion, or a sentence of volition: and he describes it as a compound quantity of sound significant, of which certain parts are themselves also significant. Thus he distinguishes a sentence from a word, which is a sound significant, of which no part is of itself significant.

The business of pointing is, to distinguish the several parts and members of sentences, so as to render the sense of it the clearest, aptest, and fullest possible. See PUNCTUATION.

In every sentence there are two parts necessarily required; a noun for the subject, and a definite verb; whatever is found more than these two, affects one of them, either immediately, or by the intervention of some other, by which the first is affected.

Again, every sentence is either simple or conjunct: a *simple* sentence is that consisting of one single subject, and one finite verb. A *conjunct*, or compounded sentence, contains several subjects, and finite verbs, either expressly or implicitly; or it consists of two or more simple sentences connected together.

A simple sentence needs no point or distinction, only a period to close it; as, *A good man loves virtue for itself*. In such a sentence, the several adjuncts affect either the subject, or the verb, in a different manner. Thus the word *good* expresses the quality of the subject, *virtue* the object of the action, and, *for itself*, the end of it. Now none of these adjuncts can be separated from the rest of the sentence; for

VOL. XXXII.

if one be, why should not all the rest? And if all be, the sentence will be minced into almost as many parts as there are words.

But if several adjuncts be attributed in the same manner either to the subject, or the verb; the sentence becomes conjunct, and is to be divided into parts.

In every conjunct sentence, as many subjects, or as many finite verbs as there are, either expressed or implied, so many distinctions may there be. Thus, *My hopes, fears, joys, pains, all centre in you*; and thus Cicero, *Catilina, abiit, excessit, evasit, erupit*. The reason of which pointing is obvious; for as many subjects or finite verbs as there are in a sentence, so many members does it really contain; whenever, therefore, there occur more nouns than verbs, or contrariwise, they are to be conceived as equal; since, as every subject requires its verb, so every verb requires its subject, with which it may agree, excepting, perhaps, in some figurative expressions.

Indeed there are some other kinds of sentences which may be ranked amongst the conjunct kind, particularly the absolute *ablative*, as it is called. Thus, *Physicians, the disease once discovered, think the cure half wrought*; where the words, *disease once discovered*, are equivalent to, *when the cause of the disease is discovered*.—So also in nouns added by apposition, as, *The Scots, an hardy people, endured it all*; so also in vocative cases and interjections, as, *This, my friend, you must allow me*: and, *What, for heaven's sake! would he be at?*

The case is much the same when several adjuncts affect either the subject of the sentence or the verb in the same manner, or at least something by which one of them is affected, as, *A good, wise, learned man is an ornament to the commonwealth*: where the several adjectives, denoting so many qualities of the subject, are to be separated from one another. Again, when I say, *Your voice, countenance, gesture, terrified him*, the several nominative cases denote so many modes of the verb, which are likewise to be distinguished from each other. The case is the same in adverbs, as, *He behaved himself modestly, prudently, virtuously*. In the first example, the adjuncts immediately affect the subject; in the third, the verb; in the following one, another adjunct, as, *I saw a man laden with age, sickness, wounds*.

Now, as many such adjuncts as there are, so many several members does the sentence contain; which are to be distinguished from each other, as much as several subjects or finite verbs; and that this is the case in all conjunct sentences, appears hence, that all these adjuncts, whether they be verbs or nouns, &c. will admit of a conjunction copulative, by which they may be joined together. And wherever there is a copulative, or room for it, there a new member of a sentence begins. For the other partitions, &c. of sentences, see COLON, SEMICOLON, and PERIOD.

SENTENCE is also used, in *Rhetoric* and *Poetry*, for a short pithy remark, or reflection, containing some sentiment of use in the conduct of life.

Such are *Discite justitiam moniti, & non temnere divos*; or, *A teneris assuescere multum est*, &c.

Sentences, father Boffu observes, render poems useful; and, besides, add I know not what lustre and spirit, which please. But there is no virtue which is not accompanied with some dangerous vice. Too many sentences give a poem too philosophical an air, and sink it into a kind of gravity; this is less fit for the majesty of a poem than the study of a learned man, and the quaintness of a dogmatist. Such thoughts not only contain, but inspire a certain calm wisdom, which is directly opposite to the passions, and cools

them both in the hearers and in the speaker. Lastly, the affectation of speaking sentences leads a person to trifling and impertinent ones, instances of which we have an abundance in Seneca's tragedies. Petronius recommends it to authors to disguise their sentences, that they may not stand glaring above the thread or ground of the discourse.

SENER HARBOUR, in *Geography*, a cove in the N.W. part of lake Winnipicogee.

SENTHENHEIM, a town of France, in the department of the Upper Rhine; 10 miles N.E. of Befort.

SENTICA, in *Ancient Geography*, a town of Spain, in the Tarragonensis, assigned by Ptolemy to the Vaccæans.

SENTICE, a country of Macedonia, according to Livy.

SENTIL, a people of the Maritime Alps, S.E. of the Bodiantici, mentioned by Ptolemy, who assigns to them the town of Dinia.

SENTIMENTS, in *Poetry*, and particularly dramatic, are the thoughts which the several persons express, whether they relate to matters of opinion, passion, business, or the like.

The manners form the tragic action, and the sentiments explain it, discovering its causes, motives, &c. The sentiments are to the manners, what these are to the fable. In the sentiments, regard is to be had to nature and probability; a madman, for instance, must speak as a madman; a lover, as a lover; a hero, as a hero. The sentiments, in great measure, are to sustain the character. The word sentiment, in its true and old English sense, signifies a *formed opinion, notion, or principle*; but of late years it has been much used by some writers to denote an internal impulse of passion, affection, fancy, or intellect, which is to be considered rather as the cause or occasion of our forming an opinion, than as the real opinion itself.

SENTINEL, GREAT, in *Geography*, an island in the East Indian sea, about 10 miles in circumference; 20 miles S.W. from the Greater Andaman. N. lat. $11^{\circ} 36'$. E. long. $92^{\circ} 40'$.

SENTINEL, *Little*, a small island in the East Indian sea, about 8 miles from the Little Andaman. N. lat. $10^{\circ} 59'$. E. long. $92^{\circ} 23'$.

SENTINEL, *Centry*, or *Sentry*, in *War*, a private soldier placed in some post to watch any approach of the enemy, to prevent surprises, and to stop such as would pass without orders, or without discovering who they are. They are placed before the arms of all guards, at the tents and doors of general officers, colonels of regiments, &c.

The word is modern; it is not long since they said, *To be on the scout*, in the same sense as we now say, *To stand sentry*, &c. Menage derives the word a *sentiendo*, from *perceiving*.

Sentinel perdue, is a sentinel placed at some very advanced and dangerous post, whence it is odds that he never returns. See *PERDUE*.

The sentinel's word, when he challenges, is, *Who is there? Qui vive, or Qui va la! Stand! Demure la!*

SENTINUM, in *Ancient Geography*, a town of Italy, in Umbria, according to Strabo and Ptolemy.—Also, a town of Italy, belonging to the Senones, S.W. of Suasa.

SENTINUS, a river of Italy, in Picenum.

SENTO, in *Geography*, a river of Naples, which runs into the Adriatic; 3 miles S.E. of Lanciano.

SENTOU, a town of China, of the third rank, in Se-tchuen, on the river Kincha; 22 miles N.E. of Pei.

SENTUR, a town of Egypt; 9 miles N.W. of Fayoum.

SENURIS, a town of Egypt, near the Birket il Kerun; 9 miles N.W. of Fayoum.

SENUM, in *Ancient Geography*, a river of Hibernia, according to Ptolemy, who places its mouth on the western coast, between the mouths of the Aufoba and of the Dur.—Also, a river of India, in the country of the Sines, according to Ptolemy, who says, that it was connected with the Cotiaria, at a great distance from its mouth.

SENZA, an Italian preposition, implying, in *Musick*, without: as in Handel's organ concertos, when passages are to be wholly left to the violins, *senza organo* implies, without the organ; *senza viola*, without the tenor; *senza basso*, without the base, &c.

SENZARSKAIA, in *Geography*, a fortress of Russia, in the government of Tobolsk; 80 miles S. of Yalutorovsk.

SEODA, a sea-port of Japan, on the S. coast of the island of Nippon; 105 miles E. of Meaco. N. lat. $37^{\circ} 20'$. E. long. $139^{\circ} 10'$.

SEON, in *Ancient Geography*, a town of Palestine, in the tribe of Issachar, according to Joshua. Eusebius says, that in his time there was a place of this name at the foot of mount Tabor.

SEON St. Henry, in *Geography*, a town of France, in the department of the Mouths of the Rhone; 4 miles N. of Marfeilles.

SEOUJI KIAMEN, a post of Chinese Tartary, in the country of the Monguls; 23 miles S.W. of Kara Hotun.

SEPARABLE MODES. See *MODE*.

SEPARATE AFFECTION. See *AFFECTION*.

SEPARATE, *Penultimate of the*. See *PENULTIMATE*.

SEPARATE Island, in *Geography*, a small island in the Chinese sea. N. lat. $3^{\circ} 6'$. E. long. $107^{\circ} 45'$.

SEPARATED FLOWERS, in *Botany*, are so called when the stamens and pistils are situated in different flowers of the same species. Hence it appears that separated flowers are confined to such plants as are either monoecious, dioecious, or polygamous. They are termed by Linnæus, *DICLINES*.

SEPARATORS, among *Horses*, the teeth usually called incisors, by which the animal separates or bites off a portion of his food for chewing. See *TEETH*.

SEPARATION, in *Navigation*, the same with what we more usually call *departure*.

SEPARATION of Man and Wife. See *DIVORCE*.

SEPARATION, *Waters of*. See *WATER*.

SEPARATION Bay, in *Geography*, a bay in the Straits of Magellan, on the coast of Terra del Fuego; 10 miles S.E. of Cape Pillar.

SEPARATISTS, in *Ecclesiastical History*, a religious sect in England, so denominated from their setting up a *separate* church, different from that established by law. See *DISSENTERS*, &c.

At present, Separatists is rather the name of a collection of sects than of any particular one; but nearer their original, there was that agreement among them, that one name served them all.

Their division into Presbyterians, Anabaptists, Independents, &c. is a more modern thing.

The Separatists, Hornius tells us, Hist. Eccl. are such as under Edward VI. Elizabeth, and James I. refused to conform to the church of England, and who were first called Puritans, then Separatists, and lastly, Nonconformists.

The first leader of the Separatists was Bolton, who, upon quitting the party he had formed, was succeeded by Robert Brown, from whom the Separatists were called Brownists.

SEPARATORIUM, the name of a surgical instrument used for separating the pericranium from the skull.

SEPARATRIX, in *Arithmetic*, denotes the point, or comma, which separates and distinguishes decimals from integers; thus, 465.32 or 465.32.

SEPARI,

SEPARI, in *Ancient Geography*, a people who inhabited an island on the coast of Liburnia, according to Pliny.

SEPAUNAGUR, in *Geography*, a town of Hindoostan, in the circle of Bopal; 30 miles W. of Hussingabad.

SEPAUX, a town of France, in the department of the Yonne; 9 miles W. of Joigny.

SEPELACUS, in *Ancient Geography*, a place of Spain, upon the route from Tarragon to Carthage, between Ildua and Saguntum, according to the Itinerary of Antonine.

SEPHAAT, or **ZEPHAT**, a town of Palestine, in the tribe of Simeon, according to the book of Judges.

SEPHALITES. See **MOATAZALITES**.

SEPHAMA, in *Ancient Geography*, a town of Asia, in Syria, which served as a limit to the land of promise, according to the book of Numbers.

SEPHAR, a mountain of the East, probably about Armenia. (See Gen. x. 30.) This mountain seems to have been the habitation of the Sepharvaim and of the Suspires, mentioned by geographers.

SEPHARVAIM, a people who were brought by Shalmanazer into Palestine, to supply the place of the Israelites, whom he carried away from Samaria to a country beyond the Euphrates (2 Kings, xvii. 24. 31.) A.M. 3283, B. C. 1721. Their former habitations seem to have been on the mountains of Sephar, and the Suspires or Suspires, who, according to Herodotus (lib. i. iii. vii.) were the only people that inhabited between the Colchians and the Medes, were probably the Sepharvaim. The Scripture speaks (Isaiah, xxxvii. 13. 2 Kings, xix. 13.) of the city of Sepharvaim, which was probably the capital of these people, and the king of Sepharvaim was the god of these people. See 2 Kings, xviii. 34. If. xxxvii. 13. 2 Kings, xix. 13.

SEPHIROS, a word used by Paracelsus and his followers, to express a sort of dry and hard imposthume, or kind of spurious scirrhus.

SEPHIROTH, a Hebrew word signifying *brightneses*; and the cabalists give the name of sephiroth to the most secret parts of their science.

SEPHORIS, in *Ancient Geography*, a famous city of Zebulun, and the capital of Galilee; afterwards named Diocæsarea; 18 according to some, and according to others 19 miles from Tiberias. It was not far from Tabor and the great plain. Josephus represents it as the largest and best city in Judea, and states, that it became the capital of it, after Nero had given Galilee to the younger Agrippa. The first city of Galilee in going from Ptolemais was Sephoris. Joseph. de Bello, l. ii. c. 23. l. iii. c. 1.

SEPHOURY, or **SAFFURE**, in *Geography*, a town or village of Palestine, anciently *Sephor* or *Sephoris*, which was once the strongest town of the country, and capital of Galilee, before Tiberias; called also Diocæsarea. Here was held one of the five judicatures of Palestine. It was fortified by Herod, and destroyed in the time of Constantius, on an insurrection of the Jews. It was once much venerated as the habitation of Joachim and Anna, parents of the blessed Virgin; 12 miles N.W. of Tabaria.

SEPIA, in *Ancient Geography*, a mountain of the Peloponnesus, in Arcadia, to the left of mount Geronte, near a place called Tricène, upon which Ægyptus, the son of Elatus, died from the sting of a serpent, and where he was buried, according to Pausanias.

SEPIA, in *Natural History*, the *Cuttle-fish*, a genus of the Vermes-Mollusca class and order, of which the generic character is as follows; the body is fleshy, receiving the breath in a sheath, with a tubular aperture at its base; it has eight arms, beset with numerous warts or suckers, and in most

species two pedunculated tentacula; the head is short; the eyes large; the mouth resembling a parrot's beak.

These animals inhabit various seas, and in hot climates some of them grow to an enormous size: they are armed with a dreadful apparatus of holders furnished with suckers, by which they fasten upon and convey their prey to the mouth; they have the power of squirting out a black fluid resembling ink, and which is said to be an ingredient in the composition of Indian ink; the bone in the back is converted into pounce: the eggs are deposited upon sea-weed, and exactly resemble a bunch of grapes; at the moment the female deposits them they are white, but the males pass over them to impregnate them, and they then become black; they are round, with a little point at the end, and in each of them is enclosed a living cuttle-fish, surrounded by a gelatinous fluid. There are eight species, of which five are natives of this country.

Species.

* **OCTOPUS**. The specific character of this species is, that the body has no tail or appendage; it has no pedunculated tentacula, or longer arms. It is found in the Mediterranean and Indian seas, in the latter of which it sometimes grows to a vast size; the arms are said to be eight or nine fathoms long. In these seas the Indians never venture out without hatchets in their boats, to cut off the arms, should it attempt to fasten upon them under water. This species is characterized by the shortness of the body, which is rounded behind; the arms taper to a point, joined at the base by a membrane or web, and covered within with two rows of alternate suckers. When opened this animal is said to exhibit so brilliant a light as to illuminate a large room.

* **OFFICINALIS**. Body without tail or appendage, and surrounded by a margin; it has two tentacula, or longer arms. This is found on our own coasts, and also in other oceans, and is frequently the prey of the whale tribe, and of plaice; its arms are frequently eaten by the conger-eel, and are reproduced; the bony scale on the back is that which is sold in the shops; and the black matter which it squirts out to darken the waters round it, and elude the pursuit of its enemies, is sometimes used as ink. The body was eaten by the ancients, and it is even now used as food by the Italians. The body of this species is ovate, the margin crenate, and interrupted at the bottom; eight of the arms are short and pointed; the two tentacula are four times as long as the others; they are rounded, and the tips are very broad, and furnished within with numerous suckers.

UNGUICULATA. The body of this is without a tail or appendage; the arms are furnished with hooks, and it is found in the Pacific ocean. The body is rounded behind; the arms are furnished with hooks, which are retractile within their proper sheaths instead of suckers.

HEXAPUS. The body of this is tailed, four or five-jointed; arms only six in number. This also is found in the Pacific ocean. The body is about half a foot long, and the thickness of a finger; arms furnished with very minute suckers, which stick fast to whatever it fixes on.

* **MEDIA**. Body long, slender, cylindrical; the tail is finned, pointed, and carinate on each side; it has two long arms. It inhabits the ocean, and in some respects it resembles the *S. officinalis*. The body ends in a point, and is furnished with a membrane on each side, commencing about the middle of the body.

* **LOLIGO**; the Calamary. The body of this is subcylindrical, subulate, and furnished with a flattish sharp-edged rhombic membrane at the tail on each side. This is found in divers parts of the ocean, and is from nine to twelve

inches long. The body is of a reddish-brown, with two longer arms or tentacula; the eyes are of a fine blue; the cartilaginous plate or bone in the back is long, lance-shaped, and transparent; it has sometimes been placed as a species of the pennatula.

* *SEPIOLA*. The body of this species has two rounded wings or processes behind. It is found in the Mediterranean and European seas, and is very small. The body is short, rounded behind, with a round membrane or fin at the lower extremity; it has two long arms.

TUNICATA. The body of this species is entirely enclosed in a black pellucid membrane, with two semicircular wings or processes behind. This is an inhabitant of the Pacific ocean. The body is very large, and is said sometimes to weigh one hundred and fifty pounds, and is convertible into palatable and pleasant food.

SEPIACE, in *Italian Music*, signifies that the part it is joined to may be repeated or not, at pleasure.

SEPIAS, in *Ancient Geography*, a promontory of Thesfaly, in Magnesia, at the entrance of the Pelasgic gulf, according to Ptolemy. Cape Sepias is now the promontory of St. George's.

SEPIUSSA, an island situated on the coast of Asia Minor, in the Ceramic gulf, according to Pliny.

SEPOORY, in *Geography*, a fortress of Hindoostan, in the circar of Gohud; 18 miles S.W. of Narwa.

SEPOU, a town of Hindoostan; 12 miles S.W. of Agra.

SEPPRA, or *SIPPRA*, a river of Hindoostan, which rises near Indore, joins the Callisind in the circar of Kitchwara, and, united with other streams, forms the Chumbul.

SEPRIO, a town of Italy, in the department of the Olona; 20 miles N.W. of Milan.

SEPS, in *Zoology*, the name of a very peculiar animal of the lizard or lacerta kind, but seeming as if of a middle nature between that genus and the snakes, and appearing rather a serpent with feet than a lizard.

It is a small species; its body is rounded, and its back variegated with longitudinal lines of black; its eyes are black; it has ears, and a small and very slender tail. What appears most singular in it is, that it has four legs, with feet divided into toes; the first pair are placed very near the head, the other by the anus; the scales are laid in a reticulated manner, they are of an oblong figure, approaching to a rhomboides, and laid longitudinally; its belly is white, with a slight cast of blue, and it has nostrils near the end of the snout. Columna took five living young ones out of the body of one of this species, some of which were included in membranes, and others loose, as is the case in the fœtus found in the viper.

The bite of the seps is said to occasion an instant putrefaction of the flesh of the whole body.

SEPT MONCEL, in *Geography*, a town of France, in the department of the Jura; 2 miles E. of St. Claude.

SEPTA, in *Antiquity*, were inclosures, or rails made of boards, through which persons went in to give their votes in the assemblies of the Romans.

The word also signifies divisions, and, in that sense, is used to express the plates of spar, which separate or divide the tali of the ludus Helmontii, thence called by Dr. Hill, *septariæ*; which see.

SEPTALIUS, or *SETTALA*, LOUIS, in *Biography*, an Italian physician of celebrity, was born at Milan, in February, 1552. He evinced from his early childhood, a strong inclination to the pursuits of literature, and at the age of sixteen defended some theses on the subject of natural

philosophy with an acuteness of reasoning far above his years, and which excited the surprise of the audience, among whom was the archbishop of Milan. It was now supposed that he would follow the steps of his ancestors, both maternal and paternal, who had been much distinguished at the bar; but his inclination led him to the medical profession, and he accordingly repaired to Pavia, for the purpose of commencing the study of it. Here he proceeded with the same success, and obtained the degree of doctor in his 21st year, and was even appointed to a chair in this celebrated university in his 23d year. In his professorial capacity, though so young, he gave so many demonstrations of his talents and acquirements, that he soon became known to the most distinguished men of his time. Nevertheless, at the end of four years from the time of his appointment, he determined to relinquish the professorial dignity, for the purpose of exercising his medical skill in his native city. While he was engaged in the practice of his art at Milan, Philip III., king of Spain, selected him for his historiographer. But though fully sensible of the value of this compliment, yet neither this, nor many other more congenial honours, that were offered to him, could induce him to quit his native city, to which he was ardently attached. He was invited by the elector of Bavaria to a professorship in the university of Ingoldstadt; by the grand duke of Pisa, to a chair at that place; and by the city of Bologna to a similar appointment in their schools; and the senate of Venice, by still more considerable offers both of honour and reward, laboured assiduously to bring him to the university of Padua. But he declined all these opportunities of elevation, content with the esteem and affection of his fellow-citizens, which he amply obtained; and with the domestic felicity, which the society and education of his family, consisting of seven sons and six daughters, constantly afforded him. The only honour which he accepted was the appointment of chief physician to the state of Milan, which Philip IV. conferred upon him in 1627, as a reward for his virtues and talents. In the year 1628, the plague visited Milan. Septalius gave all the aid in his power to his fellow-citizens, and in the midst of his labours to alleviate the distresses occasioned by this fatal calamity, he was himself seized with the disease. He had scarcely recovered from this attack, when he was suddenly surprised by a fit of apoplexy, which left him speechless, and paralytic on one side. From this, however, he in a great measure recovered, and lived several years afterwards, but in a state of feebleness and imperfect health. He died in September 1633, in consequence of an attack of dysentery, at the age of 81. Septalius was a man of acute powers, and solid judgment, and was reputed extremely successful in his practice. He was warmly attached to the doctrines of Hippocrates, whose works he never ceased to study. He was author of the following works: "In Librum Hippocratis Coi, de Aëribus, Aquis, et Locis, Commentarii quinque," 1590; "In Aristotelis Problemata Commentaria Latina," tom. i. 1602, ii. 1607; "De Nævus Liber," 1606. In this work Septalius has not displayed his usual judgment; for he ascribes the *nævi*, or mother-spots, to the imagination of the pregnant mother, and deduces from their appearances many practical inferences, which are as unfounded as the notion of their origin. "Animadversionum et Cautionum Medicarum Libri duo, septem aliis additi," 1629. This is a valuable work, the result of 40 years of practice, and equal to any of its contemporaries of the 17th century. "De Margaritis Judicium," 1618; "De Peste et Pestiferis Affectibus Libri V." 1622; "Analyticarum et Animadversionum Dissertationum Libri II." 1626; "De Morbis ex mucronata

mucronata Cartilagine evenientibus, Liber unus," 1632, &c. See Eloy Dict. Hist. de la Médecine.

SEPTANA, a word used by the ancient physicians for a septenary fever, or one that performs its regular period in seven days.

SEPTARIÆ, in *Natural History*, the name of a large class of fossils, called by some *ludus Helmontii*, and by others the *waxen veins*. They are defined to be fossile bodies not inflammable, nor soluble in water, naturally found in loose detached masses of a moderately firm texture and dusky hue, divided by several septa, or thin partitions, and composed of a sparry matter greatly debased by earth, not giving fire with steel, fermenting with acids, and in great part dissolved by them, and calcining in a moderate fire.

Of this class there are two distinct orders of bodies, and under those six genera. The septariæ of the first order are those which are usually found in large masses of simple uniform construction, but divided by large septa, either into larger or more irregular portions, or into smaller and more equal ones, called *talcs*.

Those of the second order are such as are usually found in smaller masses of a crustated structure, formed by various incrustations round a central nucleus, and divided by very thin septa.

SEPTAS, in *Botany*, a name indicative of the number seven, *septem*, so prevalent in its parts of fructification.—Linn. Gen. 184. Schreb. 246. Willd. Sp. Pl. v. 2. 292. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 2. 338. Juss. Gen. 308. Lamarck Illustr. t. 276.—Class and order, *Heptandria Heptagynia*. Nat. Ord. *Succulentæ*, Linn. *Sempervivæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, permanent, cloven into seven, spreading, acute segments. *Cor.* Petals seven, oblong, equal, twice as long as the calyx. *Stam.* Filaments seven, awl-shaped, the length of the calyx; anthers nearly ovate, erect. *Pist.* Germens seven, superior, terminating in awl-shaped styles, the length of the stamens; stigmas somewhat obtuse. *Peric.* Capsules seven, oblong, acute, parallel, of one valve. *Seeds* numerous.

Ess. Ch. Calyx seven-cleft. Petals seven. Germens seven. Capsules seven, many-seeded.

1. *S. capensis*. Cape Septas. Linn. Sp. Pl. 489. Amœn. Acad. v. 6. 87. Andrews Repof. t. 90.—Native of the Cape of Good Hope. Introduced at Kew in 1774, where it flowers in August and September. *Root* perennial, tuberous, fibrous. *Stem* short, simple, crowned with a tuft of about four, opposite, blunt, naked, notched, succulent leaves; the lower ones larger, slightly stalked, roundish; upper oval, sessile, narrower. *Flower-stalk* slender, somewhat wavy, naked, terminated by a simple umbel, composed of seven or eight elegant, drooping flowers, of a deep pink colour on the outside, flesh-coloured and white within-side. *Bractæas* in pairs, lanceolate.

The peculiarity of character in *Septas*, with regard to the prevalence of the number seven, in the parts of fructification, is not so constant as Linnæus seems to have imagined; hence Thunberg was induced to refer this genus to *Cras-fula*.

Loureiro has given the name of *Septas* to a plant in *Didy-namia Angiosperma*, which, according to professor Martyn, is allied to *Thunbergia*.

SEPTE, in *Ancient Geography*, a town of Asia Minor, in Phrygia, according to Ptolemy.

SEPTEM AQUÆ, a town of the Sabines, situated on an eminence, and commanding the Rura rosea, or the fine Rosean valley. It is supposed by the abbé Chaupi to be the present Pont Grispoldi.

SEPTEM ARÆ, *Arronches*, a place of Hispania, between Matufarum and Budua, according to Antonine's Itinerary. It was situated towards the N.W. of Emeritan Augusta.

SEPTEM FRATRES, a mountain of Africa, in Mauritania Tingitana. Ptolemy calls it Heptadelphus Mons, and places it on the Northern coast, between Exilissa and Abyla.

SEPTEM MARIA, a name given, according to Herodian, to the marshes which were formed by the seven branches of the Eridanus, before its discharge into the Adriatic sea.

SEPTEM PAGI, the name of a plain of Italy, on the bank of the Tiber, in the country of the Veians, according to Dionysius of Halicarnassus.

SEPTEM PEDA, a town of Italy, in the Picenum, according to Strabo. Frontinus makes it a Roman colony, and gives it the title of Oppidum.

SEPTEMBER, the ninth month of the year, reckoned from January, and the seventh from March, whence its name, *viz.* from *septimus*, seventh.

The Roman senate would have given this month the name of *Tiberius*, but that emperor opposed it; the emperor Domitian gave it his own name *Germanicus*; the senate under Antoninus Pius gave it that of *Antoninus*; Commodus gave it his surname *Herculeus*, and the emperor Tacitus his own name *Tacitus*. But these appellations are all gone into disuse.

SEPTEMES, in *Geography*, a town of France, in the department of the Isere; 9 miles E. of Vienne.

SEPTEMVIR, in *Antiquity*. See QUINQUEVIR.

The Germans sometimes use the word *septemvirate*, for the seven electors of the empire. See ELECTOR.

SEPTENA, in *Ancient Geography*, a town of Asia Minor, in Lydia.

SEPTENTRIO, or SEPTENTRIONES, in *Astronomy*, a northern constellation of stars, more usually called *Ursa Minor*, or the *Little Bear*; and by the people, *Charles's Wain*; though the seven stars in the Great Bear have been of late so denominated.

The word is formed from the Latin *septem*, seven; and *triones*, bullocks, which, in the ancient constellation, were yoked to the plough.

SEPTENTRIO, in *Cosmography*, the same with *north*; thus called from the ancient constellation Septentrio, one of whose stars is the pole-star. Hence also,

SEPTENTRIONAL, SEPTENTRIONALIS, something belonging to the north; as *septentrional signs*, *septentrional parallels*, &c. are those on the northern side of the equator.

SEPTERION, ΣΕΠΤΕΡΙΟΝ, in *Antiquity*, a Delphic festival, celebrated every ninth year, in memory of Apollo's victory over Python. The chief part of the solemnity was a representation of Python pursued by Apollo.

SEPTEUIL, in *Geography*, a town of France, in the department of the Seine and Oise; 9 miles N.W. of Montfort.

SEPTFOIL, in *Botany*. See TORMENTIL.

SEPTFONS, in *Geography*, a town of France, in the department of the Lot; 16 miles N.E. of Montauban.

SEPTICOLLIS, in *Ancient Geography*, a name, or rather an epithet, given to the city of Rome.

SEPTICS, among *Physicians*, an appellation given to all such substances as promote putrefaction.

From the many curious experiments made by Dr. Pringle to ascertain the septic and antiseptic virtues of natural bodies, it appears that there are very few substances of a truly septic nature. Those commonly reputed such by authors, as the alkaline and volatile salts, he found to be no wise septic. However, he discovered some, where it seemed least

least likely to find any such quality; these were chalk, common salt, and testaceous powders. He mixed twenty grains of crab's eyes, prepared with six drachms of ox's gall, and an equal quantity of water. Into another phial he put an equal quantity of gall and water, but no crab's eyes. Both these mixtures being placed in the furnace, the putrefaction began much sooner where the powder was, than in the other phial. On making a like experiment with chalk, its septic virtue was found to be much greater than that of the crab's eyes: nay, what the doctor had never met with before, in a mixture of two drachms of flesh, with two ounces of water and thirty grains of prepared chalk, the flesh was resolved into a perfect mucus in a few days.

To try whether the testaceous powders would also dissolve vegetable substances, the doctor mixed them with barley and water, and compared this mixture with another of barley and water alone. After a long maceration by a fire, the plain water was found to swell the barley, and turn mucilaginous and four; but that with the powder kept the grain to its natural size, and though it softened it, yet made no mucilage, and remained sweet.

Nothing could be more unexpected, than to find sea-salt a hastener of putrefaction; but the fact is this: one drachm of salt preserves two drachms of fresh beef in two ounces of water, above thirty hours uncorrupted, in a heat equal to that of the human body; or, which is the same thing, this quantity of salt keeps flesh sweet twenty hours longer than pure water; but then half a drachm of salt does not preserve it above two hours longer. Twenty-five grains have little or no antiseptic virtue, and ten, fifteen, or even twenty grains, manifestly both hasten and heighten the corruption. The quantity which had the most putrefying quality, was found to be about ten grains to the above proportion of flesh and water.

Many inferences might be drawn from this experiment: one is, that since salt is never taken in aliment beyond the proportion of the corrupting qualities, it would appear that it is subservient to digestion, chiefly by its septic virtue, that is, by softening and resolving meats; an action very different from what is commonly believed.

It is to be observed, that the above experiments were made with the salt kept for domestic uses. See Pringle's *Observ. on the Diseases of the Army*, p. 348, seq. See *SALT* and *SCURVY*.

From some experiments of Mr. Canton, it appears likewise, that the quantity of salt contained in sea-water hastens putrefaction; but since that precise quantity of salt which promotes putrefaction the most, is less than that which is found in sea-water, he concludes it probable, that if the sea were less salt, it would be more luminous. See *Luminousness of the SEA*.

SÉPTIÈME, Fr. *Septima*, Lat. *Settima*, Ital. the seventh. Brossard has been the guide of all subsequent musical lexicographers. He has been very awkwardly translated by Grassineau; Grassineau has been followed in the last folio edition of Chambers; and Rousseau, who writes clearly and elegantly, has retained the mixture of theory, ratios, and the useless jargon of major and minor tones and semi-tones, with practice, so much, as to render the useful knowledge of this important interval totally unintelligible to young students in harmony; to whom we shall address all we have to offer on the subject of the present article, referring scientific enquirers to *Harmonics*, *Ratios*, and the definitions of major and minor tones and semi-tones.

The 7th in music, is one of the principal discords; some say the only original discord, as all the rest are derived from it. The 2d and the 9th are only inversions of the 7th. The

4th in itself is a concord, and only made a discord by another discord being struck upon it; but the 2d and the 9th, however, derived from inversion, are discords to the ear at all times and in all places.

There are three kinds of 7ths used in practical harmony; the minor, or flat 7th, ten semi-tones, or half notes, above the base; the major, or sharp 7th, eleven semitonic intervals above the base; and the extreme flat 7th, only nine half notes above the base or lowest note, as $\begin{matrix} B & b & B & \sharp \\ C & , & C & , \end{matrix}$ and $\begin{matrix} F & b \\ F & \times \end{matrix}$.

In counterpoint and thorough-bass, the 7th is accompanied by the $\frac{5}{3}$, or common chord, from which its harmony only differs by the addition of that single sound from the triad. And as a base, in practice, is called fundamental, by being accompanied only with the common chord, the addition of the 7th to this common chord does not rob the base figured with a 7th of its title of fundamental.

The 7th in binding notes is prepared in the 3d, 5th, 6th, and 8th, and resolved on the 6th, 3d, and 5th.

Dr. Pepusch has given an excellent chapter on 7ths prepared and resolved in the treble; but to his instructions for 7ths prepared and resolved in the bass, p. 37 of the text, we cannot subscribe. See *PEPUSCH*, and *Analysis* of his *Treatise on Harmony*.

The 7th is the only discord which need not be always prepared.

The sharp 7th, which the French call *la note sensible*, till about the middle of the last century, was only used in recitative; but since that time it has been rapidly increasing in favour; first in German symphonies, and afterwards in songs, and every species of elegant music. Its chord is frequently indicated by a 7, a sharp 7th; but different masters frequently use the following numerical expressions of this chord: $\frac{7}{2}$, $\frac{7}{4}$, $\frac{7}{3}$, and $\frac{7}{5}$. Its origin is an appoggiatura organized.

The extreme flat 7th gives what has been termed by Rousseau the enharmonic chord, consisting entirely of flat 3ds, whence twelve modulations may be acquired, by making each note of the chord the sharp 7th, or leading note to a new key; by which means these three chords $\begin{matrix} \sharp 7 & \sharp 7 \\ G \times & A \times \end{matrix}$

$\begin{matrix} 7 \\ B \times \end{matrix}$, give 36 modulations. See *Music Plates*, and *INTERVALS*, *CHORDS*, *MODULATION*, and *COUNTERPOINT*.

SEPTIER, or *SETIER*, a French measure, differing according to the species of the things measured.

For dry measure, the septier is very different in different places and different commodities; as not being any vessel of measure, but only an estimation of several other measures.

At Paris, the septier of wheat consists of two mines, the mine of two minots, and the minot of three bushels or boisseaux, and 12 septiers are a muid. The boisseau contains 16 litrons. A muid of wheat weighs about 2880lbs. poids de marc; and a septier, 240lbs. But a muid of oats contains 24 septiers. The boisseau is a cylinder 8 inches $2\frac{1}{2}$ lines in height, and 10 inches in diameter: its contents are, therefore, 644 French cubic inches, or 780 English ditto; hence 11 septiers of Paris are = 6 English quarters, and 11 boisseaux = 4 English bushels. A muid of salt contains also 12 septiers, and a septier, 4 minots, 16 boisseaux, 256 litrons, or 4096 mesures, weighing about 400lbs. poids de marc, or 432lbs. avoirdupois. At Abbeville 18.87 septiers are equal to 10 English quarters, and each septier is 9364 cubic inches.

inches. At Amiens, 85.79 septiers = 10 English quarters, and each septier = 2005 cubic inches. At Arles, 47.40 septiers = 10 English quarters, and each septier = 3628 cubic inches. At Boulogne, 16.32 septiers = 10 English quarters, and each septier = 10,535 cubic inches. At Calais, 16.95 septiers = 10 English quarters, and each septier = 10,144 cubic inches. At Certe, 42.98 septiers = 10 English quarters, and each septier = 4002 cubic inches. At Liege, 94.14 septiers = 10 English quarters, and each septier = 1827 cubic inches. At Montpellier, 53.21 septiers = 10 English quarters, and each septier = 3232 cubic inches. At Nantes, 19.68 septiers = 10 English quarters, and each septier = 8739 cubic inches. At Paris, 18.38 septiers = 10 English quarters, and each septier = 9360 cubic inches. At Rouen, 15.75 septiers = 10 English quarters, and each septier = 10,920 cubic inches. At St. Valery, 18.38 septiers = 10 English quarters, and each septier = 9356 cubic inches.

The septier is also a liquid measure at Paris and in other parts of France, and at Geneva. A muid of wine at Paris and in some other parts of France, contains 36 septiers, 144 quarts or pots, or 288 pintes, and 280 pintes without the lees. The pinte contains 2 chopines, 4 demi-septiers, or 8 poissous, in all $47\frac{1}{2}$ French cubic inches, or $57\frac{1}{2}$ English ditto; so that a French pinte is nearly equal to an English quart; and a muid of wine contains $71\frac{1}{2}$ English gallons.

At Geneva, the char, wine measure, contains 12 septiers; the septier, 24 quarterons, or 48 pots; and the septier is = about 12 English gallons; 8.37 septiers are = 100 English gallons wine measure, and each septier = 2760 cubic inches.

SEPTIMANCA, SIMANCAS, in *Ancient Geography*, a town in the interior of Hispania Citerior, belonging to the Vaccæans. In the Itinerary of Antonine it is marked on the route from Emerita to Saragossa, between Amallobrica and Nivaria. It was situated on the Durias, S. of Pallentia.

SEPTIMENI. See SEPTUMANI.

SEPTIMINICIA, a town of Africa Propria, upon the route from Thæne to Alluræ, between Madallama and Tablata, according to the Itinerary of Antonine.

SEPTIMONTIUM, among the Romans, a festival celebrated in December, on all the seven hills of Rome; whence also it had this name, being otherwise called Agonalia.

SEPTIZON, SEPTIZONIUM, in the *Ancient Architecture*, a term almost appropriated to a famous mausoleum of the family of the Antonines, which, Aur. Victor tells us, was built in the tenth region of the city of Rome, being a large insulated building, with seven stages or stories of columns.

The plan was square, and the upper stories of columns falling back much, rendered the pile of a pyramidal form, terminated at top with the statue of the emperor Septimius Severus, who built it.

It had its name *septizon*, *septizonium*, from *septem* and *zona*, *q. d.* seven zones or girdles, by reason of its being girt with seven rows of columns.

Historians make mention of another septizon, more ancient than that of Severus, built near the Thermæ of Antoninus.

SEPTUAGESIMA, in the *Calendar*, denotes the third Sunday before Lent, or before quadragesima; and quinquagesima is the next before quadragesima, then sexagesima and septuagesima: these were all days appropriated by the church to acts of penance and mortification, by way of preparing for the devotion of the lent ensuing.

It is supposed by some to take its name from its being about seventy days before Easter: pope Telephorus first

made it a feast day, and appointed Lent to commence from it.

The laws of king Canutus ordained a vacation from judicature, from septuagesima to *quindenā pasche*. (See QUINQUAGESIMA.) From septuagesima to the octaves after Easter, marriage is forbidden by the canon law.

SEPTUAGINT, LXX, or *the Seventy*, a term famous among divines and critics, for a version of the Old Testament out of Hebrew into Greek, said to have been performed by seventy-two Jewish interpreters, in obedience to an order of Ptolemy Philadelphus.

The ancients, till Jerom's time, universally believed, that the Seventy were inspired persons, not mere translators, grounding their belief on a fabulous history of this version given by Aristeas; who tells us, that the high-priest Eleazar chose six doctors out of each tribe for this office, which made the number of seventy-two; and that these being shut up each in his several cell, each translated the whole; and without seeing what any of the rest had done, they were found to agree to a letter.

The learned Dr. Hody, "*De Bibliorum Textibus Originalibus*," &c. who seems to have studied the origin of the Greek version more accurately than any critic before him, has laboured very successfully in detecting the false story of Aristeas; and he has likewise proved, that this version was made by the Jews living at Alexandria, for the use of themselves and many thousands of their brethren, who were then settled in Egypt, and who, living among the Greeks, generally used the Greek language. And he has also proved, that the whole Hebrew bible was not translated into Greek at once, but that different parts were translated at different times: that the Pentateuch was translated first, about 285 years before Christ; that only the Pentateuch was read in the synagogues till about 170 years before Christ, when Antiochus Epiphanes, their cruel persecutor, forbade them to recite any part of the law; that soon after this prohibition, the Jews translated into Greek Isaiah, and the following prophets, for the use of the temple at Heliopolis and the Alexandrian synagogues; and that the other books were translated afterwards, with different degrees of skill and care, at various times, and by various persons. See also on this subject Prideaux's *Connect.* vol. iii. p. 38, &c. Brett's *Dissertation on the ancient Version of the Bible*, published in Bishop Watson's *Collection of Tracts*; Dupin's *Canon*, Walton's *Prolegomena*, &c. &c. See ALEXANDRIAN *Copy*, and *Greek Bible*.

SEPTUAGINT, *Chronology of the*, or *Seventy*, is an account of the years of the world, very different from what is found in the Hebrew text, and the Vulgate; making the world 1466 years older than it is found in these latter.

The critics are much divided as to the point of preference. Baronius prefers the account of the Seventy; and H. Vossius makes an apology for it. The two latest and most strenuous advocates in this dispute, are father Pezron, a Bernardine, and father Le Quien, a Dominican; the first of whom defends the chronology of the Septuagint, and the latter that of the Hebrew text. See *Sacred CHRONOLOGY*.

SEPTUM, in *Anatomy*, a name applied to various parts of the body; generally such as separate contiguous cavities.

The SEPTUM *Auricularum* in the heart is placed between the two auricles. See HEART.

SEPTUM *Cerebri* and *Cerebelli*, the falciform processes of the dura mater. See BRAIN.

SEPTUM Cordis or *Ventriculorum*, the partition between the ventricles of the heart. See **HEART**.

SEPTUM Lucidum, the part interposed between the two lateral ventricles of the brain. See **BRAIN**.

SEPTUM Narium, the partition between the nostrils. See **NOSE**.

SEPTUM Peëiniforme Penis. See the description of the penis under **GENERATION**.

SEPTUM Scroti. See **GENERATION**.

SEPTUM Thoracis, the mediastinum, which forms the partition between the two sides of the chest. See **LUNG**.

SEPTUM Transversum, or *Musculare*, the diaphragm. See **DIAPHRAGM**.

SEPTUMANI, in *Ancient Geography*, a people of Gallia Narbonnensis, who inhabited the town of Biteræ, according to Pliny. In process of time a province of their territory was denominated Septimania.

SEPU, in *Geography*, a town of Asiatic Turkey, in the government of Sivas; 40 miles S.E. of Sivas.

SEPULCHRAL, **SEPULCHRALIS**, something belonging to sepulchres or tombs.

SEPULCHRAL Column. See **COLUMN**.

SEPULCHRAL Inscriptions, are the surest monuments we have of antiquity.

SEPULCHRAL Lamps. See **LAMP**.

SEPULCHRAL, or *Sepulchralis*, is also the appellation of a sect; thus called from their supposed principal error, which was, that by the word *hell*, whither the Scripture tells us Jesus Christ descended after his death, they understood no more than his grave or sepulchre. See **HELL**.

SEPULCHRALIS Pecunia. See **PECUNIA**.

SEPULCHRE, **SEPULCHRUM**, a tomb, or place, destined for the interment of the dead.

The term is chiefly used in speaking of the burying-places of the ancients; those of the moderns we usually call tombs.

Besides the usual sepulchres for the interment, either of the whole body, or of the ashes of the burnt, the ancients had a peculiar kind, called *cenotaphia*, being empty sepulchres made in honour of some persons, who, perhaps, had no burial at all; from a superstitious opinion, that the souls of those who wanted burial wandered a hundred years before they were admitted to pass into the Elysian fields. See **BURIAL** and **CENOTAPH**.

The pyramids are supposed to have been built as sepulchres for the kings of Egypt. And the obelisks had generally the same intention.

Sepulchres were held sacred and inviolable, and the care taken of them was deemed a religious duty, grounded on the fear of God, and the belief of the soul's immortality. Those who searched or violated them, have been odious to all nations, and always severely punished.

The Egyptians call their sepulchres *eternal houses*, in contradistinction to their houses and palaces, which they called *inns*; by reason of the short sojourn we have in the one, in comparison of our long stay in the other. The eastern pilgrimages are all made with design to visit the holy sepulchre, that is, the tomb of Jesus Christ. Nobody enters here but bare-footed, and with abundance of ceremonies. The Turks exact twenty-four crowns of each pilgrim, whom devotion carries to the holy sepulchre.

SEPULCHRE, *St.*, or the *Holy Sepulchre*, gives the denomination to an order of regular canons, anciently instituted in Jerusalem, in honour of the holy sepulchre.

They ascribe their institution to Godfrey of Boulogne, who, they say, upon his taking Jerusalem in the year 1099, placed canons in the patriarchal church of the Holy Sepul-

chre, which indeed is true, but then they were not regulars. In effect, it was Arnoul, who, of archdeacon of the church of Jerusalem, got himself elected patriarch of it, that, in 1114, first obliged his canons to live in community, and to follow the rule of St. Augustine.

From the Holy Land numbers of these canons were brought into Europe, particularly into France by Louis the Younger; into England by king Henry; into Poland by Jaxa, a Polish gentleman; and into Flanders by its counts.

But the order was afterwards suppressed by Innocent VIII., and its effects given to that of Our Lady of Bethlehem, which itself ceasing, they were bestowed, in 1484, on that of the knights of St. John of Jerusalem; but the suppression did not take place in Poland, nor in several provinces of Germany, where they still subsist: their general is in Poland: their habit, father Heliot observes, has been different in different places.

SEPULCHRE, *St.*, or the *Holy Sepulchre*, is also the name of a military order, established in Palestine, as some say, by Godfrey of Boulogne, but according to others by his successor, Baldwin.

However, it is certain there were none but canons in the church of St. Sepulchre till the year 1114; and it is no more than probable, the knights were only instituted upon the ruins of the canons, four hundred years after, and that by pope Alexander VI. in order to excite rich and noble persons to visit the holy places, by giving them the title of *knights of the Holy Sepulchre*, and to this end, instituting an order under that name, of which he reserved the quality of master to himself and his successors.

Leo X. and Clement VII. granted to the guardian of the religious of St. Francis, in the Holy Land, the power of making these knights; which power, first granted *viva voce*, was afterwards confirmed by a bull of Pius IV. In 1558, the knights of this order in Flanders, chose Philip II. king of Spain, their master, and afterwards his son; but the grand master of the order of Malta prevailed on him to resign; and when afterwards the duke Nevers assumed the same quality in France, the same grand master, by his interest and credit, procured a like renunciation of him, and a confirmation of the union of this order to that of Malta.

SEPULCHRI PRETIUM. See **PRETIUM**.

SEPULVEDA, JOHN GENESIVS, in *Biography*, an eminent Spanish divine, born in the diocese of Cordova in 1491. He became distinguished for his knowledge of law, philosophy, and divinity, and was, on account of his great learning, nominated by the emperor Charles V. historiographer and theologian. His fame was chiefly owing to his version of Aristotle into the Latin language. When in the height of his reputation, he was engaged in a controversy from which he derived no honour. It is thus related:

At the time that the celebrated Las Casas, bishop of Chiapa, was pleading the cause of the oppressed Indians before the court of Spain, Sepulveda, induced by some Spaniards who had tyrannized over that people, wrote a book in the Latin language, by way of dialogue, in which he undertook to prove, that the wars of the Spaniards in the Indies were just, and founded on their right to subdue the people of that new world; that it was the duty of the Indians to submit to be governed by the Spaniards, on account of their own inferiority in knowledge and wisdom; and that if they would not voluntarily acquiesce in the Spanish dominion, they might and ought to be compelled by force of arms. Sepulveda, to add weight to his argument, declared that his whole object was to establish the right of the kings of Castille and Leon to take possession of their domain in the

the Indies. He presented his work to the royal council, and earnestly requested permission to print it. He was refused, and applied to some friends in the emperor's court. Las Casas, who was returned from the Indies, persuaded that the book would encourage the cruelties of which he complained, opposed the printing. The royal council, regarding the subject as of a theological rather than as of a political nature, referred it to the universities of Alcalá and Salamanca, both of which pronounced that it ought not to be committed to the press. The author, determined if possible to carry his point, sent his book to Rome, where it was printed. The emperor, informed of his intention, sent express orders to prohibit its circulation, and caused the copies to be seized: some of them, however, had already reached Spain. Las Casas thought it necessary to make a reply in defence of the poor Indians. The emperor at length cited the parties before the council of the Indies, and sent Dominic Soto to arbitrate between them. He heard the arguments on both sides, and made a report in favour of Las Casas. The matter, however, remained undecided; and the good bishop had not the satisfaction to see the Indians freed from their tyrants. Sepulveda died at Salamanca, of which he was a canon, in 1572. Besides the works above-mentioned, he was author of various tracts, theological and controversial, which were printed collectively at Cologne in 1602.

SEPULVEDA, in *Geography*, a town of Spain, in Old Castile, on the river Duraton; 28 miles N.E. of Segovia.

SEPYRA, in *Ancient Geography*, a town of Syria, upon mount Amanus, of which Cicero made himself master.

SEQUANA, a river which separated the country of the Gauls from that of the Belgæ, according to Cæsar. It is the present Seine.

SEQUANI, a people of Gaul. In the time of Cæsar they were in Celtica, but Augustus places them in Belgica.

SEQUATUR *sub suo periculo*, in *Law*, a writ that lies, when a *summons ad warrantizandum* is awarded, and the sheriff returns that the party hath nothing by which he may be summoned; then goes forth an *alias* and a *pluries*; and if he comes not on the *pluries*, this writ shall issue.

SEQUEANG, in *Geography*, a town of Pegu, on the Irawaddy, 20 miles N. of Rangoon.

SEQUEL, SEQUELA, in *Logic*, a consequence drawn from some preceding proposition.

As if I say, *The human soul is immaterial, and therefore immortal*; the last member of the sentence is a *sequel* of the first.

SEQUENCE, French, from *sequor*, *I follow*, in *Gaming*, a series or set of cards immediately following each other in the same suit or colour.

We say, a sequence of four cards, of five, &c. At piquet, these are called tierces, quarts, quints, &c.

SEQUESTRATION, SEQUESTRATIO, in *Common Law*, the act of separating a thing in controversy, from the possession of both parties, till the right be determined by course of law.

This is of two sorts, *voluntary* and *necessary*: *voluntary*, when it is done by consent of both parties; and *necessary*, being that which the judge doth by his authority, whether the parties will or not.

SEQUESTRATION, in the *Civil Law*, is the act of the ordinary, disposing of the goods and chattels of one deceased, whose estate no man will meddle with.

A widow is also said to *sequester*, when she disclaims

VOL. XXXII.

having any thing to do with the estate of her deceased husband.

Among the Romanists, in questions of marriage, where the wife complains of impotency in the husband, she is to be sequestered into a convent, or into the hands of matrons, till the process be determined.

SEQUESTRATION is also used for the act of gathering the fruits of a benefice void, to the use of the next incumbent.

Sometimes a benefice is kept under sequestration for many years, when it is of so small value, that no clergyman fit to serve the cure, will be at the charge of taking it by institution; in which case the sequestration is committed either to the curate alone, or to the curate and churchwardens jointly. Sometimes the profits of a living in controversy, either by the consent of the parties, or the judge's authority, are sequestered and placed for safety in a third hand, till the suit is determined, a minister being appointed by the judge to serve the cure, and allowed a certain salary out of the profits. Sometimes the profits of a living are sequestered for neglect of duty, for dilapidations, or for satisfying the debts of the incumbent. And this is, where a judgment hath been obtained against a clergyman, and upon a *feri facias* directed to the sheriff to deny the debt and damages, he returns, that the defendant is a clerk beneficed having no lay fee. Whereupon a *levari facias* (see LEVARI) is directed to the bishop to levy the same of his ecclesiastical goods, and by virtue thereof the tithes shall be sequestered. (Watson. c. 15.) In this case the bishop may name the sequestrators himself, or grant the sequestration to such persons as shall be named by the party who obtained the writ. If the sequestration be laid and executed before the day of the return of the writ, the mean profits may be taken by virtue of the sequestration after the writ is made returnable, otherwise not. If an appeal be made against a sentence of sequestration, and lawfully presented, the party sequestered shall enjoy the profits pending the appeal. (Lind. 104.) It is usual for the ecclesiastical judge to take bond of the sequestrators, well and truly to gather and receive the tithes, fruits, and other profits, and to render a just account (Watson. c. 30.): and those to whom the sequestration is committed are to cause the same to be published in the respective churches, in the time of divine service.

The sequestrators cannot maintain an action for tithes in their own name at the common law, nor in any of the king's courts; but only in the spiritual court, or before the justices of the peace where they have power by law to take cognizance. When the sequestrators have performed the duty required, the sequestration is to be taken off, and the profits applied according to the direction of the ordinary, and they shall be allowed out of the profits a recompence for their trouble, and also for the supply of the cure, and also for the maintenance of the incumbent and his family, if they need it. Sequestrators refusing to deliver up their charge, may be compelled to do it by the ecclesiastical judge. If the incumbent be not satisfied with the conduct of the sequestrators in the execution of their charge, his proper remedy is by application to the spiritual judge; and if he be not satisfied with his determination, he may appeal to a superior jurisdiction.

In the time of the civil wars, sequestration was used for a seizing of the estates of delinquents, for the use of the commonwealth.

SEQUESTRATION, in *Chancery*, is a commission usually directed to seven persons therein named, empowering them to seize the defendant's personal estate and the profits of

his real, and to detain them, subject to the order of the court. It issues on the return of the serjeant at arms, in which it was certified that the defendant had secreted himself.

Sequestrations were first introduced by sir Nicholas Bacon, lord keeper, in the reign of queen Elizabeth; before which the court found some difficulty in enforcing its process and decrees: and they do not seem to be in the nature of process to bring in the defendant, but only intended to enforce the performance of the court's decree.

SEQUESTRATION, in *London*, is made upon an action of debt: in which case, the action being entered, the officer goes to the shop or warehouse of the defendant, when there is nobody within, and puts a padlock upon the door, &c. using these words, "I do sequester this warehouse, and the goods and merchandises therein of the defendant in the action, to the use of the plaintiff," &c. and having put on his seal, makes return of it to the comptroller; and after four court days, the plaintiff may have judgment to open the doors, and appraise the goods by a serjeant, who takes a bill of appraisement, having two freemen to appraise them, for which they are to be sworn at the next court holden for that comptroller; and then the officer puts his hand to the bill of appraisement, and the court giveth judgment. However, the defendant in the action may put in bail before satisfaction, and so dissolve the sequestration; and after satisfaction may put in bail *ad disprobandum debitum*, &c.

SEQUESTRATION, *Sequestratio*, in *Chemistry*, a term used by some writers to express separation.

SEQUESTRO HABENDO, in *Law*, a writ judicial for the discharging a sequestration of the profits of a church-benefice, granted by the bishop at the king's commandment, in order to compel the parson to appear at the suit of another. The parson, upon his appearance, may have this writ for the release of the sequestration.

SEQUIN, ZECAIN, *Zecchino*, a gold coin struck at Venice, Genoa, Rome, Milan, Piedmont, and Tuscany, and in several parts of the grand signior's states.

Abblancourt derives the word from *Cizicum*, or *Cizicenum*; as supposing the sequin first struck at Cizicum: Menage, from the Italian *zecchino*, of *zecca*, the name of the mint at Venice. At Florence, pieces of 3 sequins are called Rusponi (see RUSPONO); zecchini or sequins, called Gigliati, weigh 2 denari 23 grani, and are worth 13½ lire or 20 paoli. The Roman and Genoa sequins circulated here are valued at 13 lire; Venetian sequins at 13½ lire. The sequin Gigliato weighs 53½ English grains, and the gold is 23½ carats fine: it is therefore worth 9s. 6d. sterling. At Rome 100 francesconi, or 50 zecchini, are exchanged for 100 scudi Romani, more or less. At Genoa, the sequins are valued at 13 lire 10 foldi. In 1807 the Roman sequins were valued here at 14½, and the Venetian at 14½ 10s. The weight of the sequin at Genoa is 76 grains of gold 23½ carats fine, and its value is 9s. 5d. At Leghorn the sequin is current for 13 lire 6 foldi 8 denari, of moneta buona, and for 13 lire 18 foldi 3 denari of moneta langa. At Lucca in Italy the sequin passes for 14½ lire: Venetian sequins are taken at the same as other Italian sequins, and German ducats at 14 lire 6 foldi. In the island of Malta, Venetian sequins pass for 6 scudi: the scudo current money being worth 20½d. sterling. At Marseilles, Italian sequins pass for 11 livres 2 sous, more or less. At Milan, sequins, weighing 2 denari 20¾ grani, are valued at 15 lire 4 foldi. At Parma the sequin is valued at 45 lire, the lira being worth 2¾d. nearly.

At Rome, the zecchini or sequins are current at 21½ paoli, with their doubles and halves in proportion. The sequin is to weigh 2 denari 21½ grains, or 52½ English grains, and the gold is 23½ carats fine; so that it contains little more than 52 grains of pure gold, and is therefore worth 9s. 3d. sterling. At Tunis, a Venetian sequin passes for 2 piastras, 32 alpers, more or less. At Venice, the gold coins of the old republic are zecchini or sequins, with halves and quarters. The sequin is commonly reckoned at 22 lire, but it bears a fluctuating agio, which in the year 1805 was 37 per cent.: 68½ zecchini or sequins are to contain a Venetian mark of fine gold; and are said to have no alloy; the quantity of alloy, however, is small and uncertain. The Venetian sequin weighs 54 English grains nearly, and it is therefore worth 9s. 6d. sterling.

The assay of the Genoa sequin is better than the English standard of 22 carats, and its value, &c. according to the mint price of gold in England, viz. 3l. 17s. 10½d. per oz. is as follows: viz. the assay 1 carat 3½ grains, weight 2 dwt. 5¾ grs., contents in pure gold 53.4 grs., and value in sterling 9s. 5½d. The sequin of Milan is better than the English standard; its assay is 1 car. 3 grs., its weight 2 dwt. 5¾ grs., its contents in pure gold 53.2 grs., and its sterling value is 9s. 5d. The sequin, or two-ducat piece of Naples, of 1762, is worse than Eng. stand.; its assay is 1 car. 2¾ grs., weight 1 dwt. 20¾ gr., contents in pure gold 37.4 grs., and sterling value 7¾d. The sequin of Piedmont (and half sequin in proportion) is better than Eng. stand.; its assay is 1 car. 2½ grs., weight 2 dwt. 5¾ grs., contents in pure gold 52.9 grs., and value 9s. 4½d. The sequin of Rome, coined before 1760, is better than Eng. stand.; its assay is 1 car. 2 grs., weight 2 dwt. 4½ grs., contents in pure gold 51.4 grs., and value 9s. 1¾d. The assay of the sequin coined since 1760 is 1 car. 3½ grs., weight 2 dwt. 4½ grs., contents in pure gold 52.2 grs., and value 9s. 3d.

The zecchino, or sequin of Tuscany, is better than the English standard; its assay is 1 car. 3¾ grs., its weight 2 dwt. 5¾ grs., its contents in pure gold 53.6 grs., and its value 9s. 5¾d. The zecchino or sequin (the half and quarter in proportion) of Venice is better than the English standard; its assay is 1 car. 3¼ grs., its weight 2 dwts. 6 grs., its contents in pure gold 53.6 grs., and its value 9s. 5d.

The impressions on the Italian sequins are as follow: on that of Genoa, St. John the Baptist holding a cross; legend, NON SURREXIT MAJOR, i. e. a greater has not arisen, and the date; reverse, the arms of Genoa with a crown; legend, *Dux et Gub. Reipub. Genu. i. e.* doge and governor of the republic of Genoa. On that of Milan, the head of the reigning emperor of Germany, with name and title thus; JOSEPH. II. D. G. R. IMP. S. AUG. G. H. ET B. REX. A. A. i. e. Joseph the second, by the grace of God, emperor of Rome, ever august, king of Germany, Hungary, and Bohemia, archduke of Austria; reverse, arms of Milan; legend, *MEDIOLANI ET MANTUÆ DUX*, duke of Milan and Mantua. On that of Venice, a man holding a cross, and another kneeling before him with the doge's name, as ALOY. MOC. (Aloysius Mocenigo,) and the letters S. M. V. E. N. E. one above the other near the edge of the piece, i. e. *Sanctus Marcus Venetus*; also the letters D. V. X. *Dux*, duke or doge, placed in the same manner above the kneeling figure: reverse, a whole length figure of St. Mark, holding a book, and surrounded with stars; legend, SIT T. XPE. DAT. Q. TU REGIS ISTE DUCA, supposed by Muratori in his "Antiquitates Italicæ Medii Ævi," to denote, *Sit tibi Christe datum, quod (vel quia) tu regis Iste ducatum, i. e.* To thee, O Christ,

○ Christ, be it (this coin) given, because thou governeſt (universally). He, St. Mark, governs the duchy. Muratori doubts this interpretation, and ſuppoſes that *iſte* might have been originally *iſſe*. The legend, however, is curious, as being both an hexameter verſe and a monkish rhyme. The half and quarter ſequins bear the ſame impreſſions, but the legend on the reverſe is, *Ego ſum lux mundi*, i. e. I am the light of the world.

At Cochin, on the Malabar coaſt, Venetian ſequins are worth 72 fanams, of which 20 are reckoned for a rupee. At Goa, Venetian ſequins are worth 16 good tangas, each of which is worth about $7\frac{1}{2}d.$ ſterling. At Surat, the weight of a Venetian ſequin is reckoned at $9\frac{1}{4}$ valls, of which $82\frac{1}{2}$ make 1 oz. troy.

The gold coins of Turkey are the ſequin or chequeen, called the ſequin fonducli, coined in the year 1764; 100 of theſe weigh 110 Turkiſh drachms, or 5415 Engliſh grains, and they are about 23 carats fine. The ſequin fonducli at Conſtantinople paſſed at firſt for $3\frac{1}{2}$ piaſtres, or 440 aſpers; but its price was gradually raiſed to 4 piaſtres. In 1769 moſt of them were called in for a new coinage. There is another ſequin, called mahbub, or zermahbub, or gingerly; the niſſié, or half mahbub; and the roubbié, or one-third ditto: 100 mahbubs, 200 niſſiés, or 300 roubbiés, were to weigh $82\frac{1}{2}$ Turkiſh drachms, or 4061 Engliſh grains: they were at firſt 22 carats fine, but in 1781 were reduced to $19\frac{1}{4}$ carats; and in ſubſequent coinages they have been ſtill more debaſed. Venetian ſequins paſs at preſent for $9\frac{1}{2}$ piaſtres. At Alexandria in Egypt the ſequin, called funduclee, is worth 146 medini; that called zumabob is valued at 120 medini, 40 medini being = a piaſtre. At Grand Cairo in Egypt, contraſts are made in funducli and mahbub ſequins; the former are reckoned at 146 medini, and 3 mahbubs are equal to 4 pataccas, ſo that the mahbub is worth 120 medini. The only coins allowed by the Turkiſh government to be ſtruck at Cairo are the mahbub (or zermahbub) ſequins, and medini: 40 medini are valued at $19\frac{1}{2}d.$ ſterling, ſo that the mahbub is worth $4s. 9\frac{3}{4}d.$ ſterling. Mahbubs, however, of inferior value, are coined by the Beys in Egypt, and generally paſs for 110 medini. The Turkiſh coins are current at Patras in the Morea. Some European gold ducats and ſequins circulate in Perſia. The ſequin fonducli of Conſtantinople of 1773 is worſe than the Engliſh ſtandard: its aſſay is 2 car. $2\frac{1}{2}$ gr.; its weight 2 dwt. $5\frac{3}{4}$ gr.; its contents in pure gold 43.4 gr., and its ſterling value $7s. 8\frac{1}{4}d.$ The ſequin fonducli of 1789 is alſo worſe than the Engliſh ſtandard: its aſſay is 2 car. $3\frac{1}{4}$ gr.; its weight 2 dwt. $5\frac{3}{4}$ gr.; its contents in pure gold 42.9 gr., and its value $7s. 7\frac{1}{4}d.$ The double ſequin mahbub of Conſtantinople of 1773 is better than the Engliſh ſtandard: its aſſay is 1 car.; its weight 3 dwt. $4\frac{1}{4}$ gr.; its contents in pure gold 73.1 gr., and its value $12s. 11\frac{1}{4}d.$ The ſequin mahbub of 1789 is worſe than the Engliſh ſtandard: its aſſay is 2 car. 3 gr.; its weight 1 dwt. 12 gr.; its contents in pure gold 28.9 gr., and its value $5s. 1\frac{1}{2}d.$ The ſequin of Cairo of 1773 is alſo worſe than the Engliſh ſtandard: its aſſay is 3 car. $0\frac{1}{2}$ gr.; its weight 1 dwt. $15\frac{1}{4}$ gr.; its contents in pure gold 31 gr., and its value $5s. 5\frac{3}{4}d.$ The ſequin of Cairo of 1789 is alſo worſe than the Engliſh ſtandard: its aſſay is 5 car. $2\frac{1}{2}$ gr.; its weight 1 dwt. $15\frac{1}{4}$ gr.; its contents in pure gold 26.9 gr., and its value $4s. 9\frac{1}{4}d.$

As the representation of men and animals is forbidden by the Mahometan law, the Turkiſh coins have no other impreſſions than inſcriptions ſtating the names, titles, deſcent, &c. of their ſultans, with the date of the hegira, or Mahometan era. They are in the Arabic language, and the

following tranſlations from the principal coins of ſultan Selim (1789) may ſerve as a ſpecimen, as there is but little variety in the form or ſtyle of theſe compositions.

The ſequin mahbub has on one ſide, “Sultan Selim, ſon of Muſtafa Khan, may he be victorious, and his valour be bleſt, ſtruck at Slambul (Conſtantinople) in the year 1203;” and on the reverſe, “Sultan of the two lands, and ſovereign of the two ſeas, ſultan by inheritance, ſon of a ſultan.” The words, “May he be victorious, and his valour be bleſt,” are occaſionally uſed by the Turks at the end of their prayers. By the “two lands,” are meant Europe and Aſia; and by the “two ſeas,” the Black ſea and the Archipelago. The latter is alſo called here the White ſea.

The ſequin fonducli has on one ſide, “Sultan Selim, ſon of Muſtafa Khan;” and on the reverſe, “Struck at Slambul, in the year 1203.”

The impreſſions of ſequins of different periods moſtly answer to either of the foregoing deſcriptions; but the ſequins coined at Cairo, under ſultan Abdulhamid in 1773, have their inſcriptions as follows: “Sultan Abdulhamid, ſon of Ahmed Khan, may his valour be bleſt, ſtruck in Egypt in the year 1187;” and on the reverſe, the titles as on the ſequin mahbub of Selim.

The pieces of two, three, four, and five ſequins bear the ſame inſcriptions as the ſingle ſequin, and they are ſometimes alſo encircled with ornaments.

The ſequins of the Barbary ſtates are coined in the name of the grand ſeignior, and are only diſtinguiſhed by the words, “Struck at Tunis, Tripoli,” &c. They bear on the reverſe the titles as on the ſequin mahbub of Selim. Kelly’s Un. Cambiſt.

SÉRA, in *Ancient Geography*, a town of Serica, which had the title of metropolis, according to Ptolemy.

SERA, in *Geography*, a town of Hindooſtan, and capital of a diſtrict, once a conſiderable ſubah, conquered by Hyder Ali; taken from the dominions of his ſon Tippoo, and given to the Nizam in the year 1800; 58 miles N.W. of Bangalore. N. lat. $13^{\circ} 28'$. E. long. $75^{\circ} 54'$.—Alſo, a town of Hindooſtan, in Guzerat; 24 miles S. of Dunderpour.

SERA Capriola, a town of Naples, in the province of Capitanata; 14 miles S.S.E. of Termola.

SERAB, a diſtrict of Adirbeitzan, or Azerbaijan, and a town, 15 miles E. of Tabris.

SERABIS, in *Ancient Geography*, a river of Hiſpania, in the Tarragonenſis. Ptolemy.

SERACH, in the *Turkiſh Military Orders*, an officer who holds the ſtirrup of the caia of the janizaries in charge, attends him when he goes out on horſeback, and ſerves him as a meſſenger on all occaſions. After this office he has the title of *chous*; and after he has paſſed through this, he has the ſame office under the aga of the janizaries. Pococke’s Egypt, p. 168.

SERACONYA, in *Geography*, a town of Bengal; 38 miles E.S.E. of Islamabad.

SERACORRO, a town of Africa, in Bambarra; 80 miles W.N.W. of Sego.

SERAES, or SERKAS, a town of Perſia, in the province of Khorafan; 180 miles N.N.W. of Herat. The Tedzen has its ſource near this place.

SERAFINI, in *Biography*, an Italian ſinger with a feeble ſoprano voice, but ſo good an actor, that in 1754, when Metaltaſio’s “Attilio Regolo,” ſet by Haſſe, was performed in London, in the laſt ſcene of this opera, which ends with an accompanied recitative, without an air, he was conſtantly encored: but perhaps it was the poet who

was encored; for the *addio* of Regulus, returning to Carthage to certain torture and death, in spite of the prayers and intreaties of his family and all Rome, is so characteristic and truly Roman, that it must have struck every one who had the least knowledge of the Italian language, and the inflexible virtue of Regulus.

SERAGANORE, in *Geography*, a town of Hindoostan, in the Carnatic; 5 miles S.S.W. of Ootatore.

SERAGE, in *Ornithology*, an English name for a bird of the larus, or gull-kind, more usually called the *sea-swallow*, and by authors *sterna*.

SERAGIO, in *Geography*, a town of the island of Corfica; 6 miles S. of Corve.

SERAGLIO, a district of Italy, south of Mantua, in which Augustus had some possessions; called also "Virginian Fields."

SERAGLIO, formed of the Turkish word *serai*, which is borrowed from the Persian *seraw*, signifying a *house*, among the Levantines denotes the palace of a prince or lord.

At Constantinople they say, the seraglio of the ambassador of England, of France, &c.

The seraglio is used, by way of eminence, for the palace of the grand seignior at Constantinople, where he keeps his court, and where his concubines are lodged, and where the youth are trained up for the chief posts of the empire.

It is a triangle about three Italian miles round, wholly within the city, at the end of the promontory Chrysoceas, now called the Seraglio Point. The buildings run back to the top of the hill, and from thence are gardens that reach to the edge of the sea. It is inclosed with a very high and strong wall, upon which there are several watch towers: and it has many gates, some of which open towards the sea-side, and the rest into the city: but the chief gate is one of the latter, which is constantly guarded by a company of capoochees, or porters; and in the night it is well guarded towards the sea.

The outward appearance, du Loir tells us, is not beautiful, in regard the architecture is irregular, being cantoned out into separate edifices and apartments, in manner of pavilions and domes. No stranger, it is said, has ever yet been admitted to the inmost parts of the seraglio. See SULTANA.

The old seraglio is the place where the emperor's old mistresses, who have died or who have been deposed, and the sultanas that have belonged to the deceased grand seigniors, are kept.

They are here fed and maintained with some luxury, and served with much attention, but they can no longer go out of this place of retirement; for it would not be decent, in the estimation of the Mussulmans, that a slave, supposed to have enjoyed the favours of a sultan, should pass into the arms of another man.

The *harem* is that quarter of the seraglio in which the females are kept. This is soon replenished, because traders come from all parts to offer young slaves, and the pachas and great men are eager to present beauties capable of fixing the attention of the sovereign; thus hoping to obtain instantly his good graces, and place about his person the women who at some future time may be useful to them.

It is very difficult, and perhaps impossible, to learn exactly the manner in which the female slaves are treated in the harem of the grand seignior: never has the eye of the observer penetrated into this abode of hatred, jealousy, and pride; into this abode where pleasure and love have so seldom resided. But, according to the account of the women, whose profession calls them thither, the reader may represent to himself three or four hundred black eunuchs,

malicious, peevish, tormented by their impotence, cursing their nullity, endeavouring to counteract the female slaves intrusted to their charge; then a considerable number of young women, whose hearts would willingly expand, whose senses are moved at the idea of the pleasures which they wish in vain to know, jealous of the happiness which they are persuaded that their rivals enjoy, cursing the overseers who perplex them, solely taken up with their toilet, with their dress, and with all the nonsense which idleness and ignorance can suggest to them; seeking, rather from vanity than from love, every means of pleasing a master, too frequently disdainful. We may represent to ourselves, in short, a sultan young or old, mastered by ridiculous prejudices, without delicacy, often whimsical or capricious, alone in the midst of five or six hundred women, all equally beautiful, in whom he gives birth to desires which he is unable to gratify, who enjoys with them no pleasures but such as are too easy and without prelude, in which the heart has no share, and we shall have a true idea of what passes in the harem of the grand seignior.

The charge of the women is intrusted only to black eunuchs, whose mutilation is such, that there remains no trace of their sex. Oriental jealousy has very rightly judged, that such creatures were rather capable of inspiring sentiments of hatred and contempt, than those of affection and friendship, which would not have failed to take birth, if the charge of the harem had been intrusted to women. It was not enough to condemn these unfortunate females to long privations, never to let them know of love only what was to excite in them desires, it was even necessary to deprive them of the consolation of opening their heart in the bosom of friendship.

The chief of the black eunuchs, called *kislar-aga*, is one of the greatest personages of the empire: he it is who carries to the female slaves the will of his master; he it is who announces to them the happiness which they have to please him. Independently of the authority which he exercises in the harem, he has the superintendence of all the imperial mosques; he is charged with the general administration of all the pious foundations which relate to them; he has the pre-eminence over the chief of the white eunuchs, and, what is more flattering to a slave, he more frequently approaches his master, and more commonly enjoys his confidence. His income is very considerable.

The *khafne-vekili* is the second eunuch of the seraglio: he replaces the *kislar-aga*, when he dies, or is turned out of office. He has the general administration of the interior imperial treasure, which must be distinguished from the private treasure of the grand seignior, administered by the *khafnadar-aga*, one of the pages of confidence. There are some other eunuchs raised in dignity, such as he who belongs to the queen-mother, he to whom the care of the princes is intrusted, those who serve the royal mosque of the sultana Validai, whither the slaves of the grand seignior go to say their prayers; he who has the particular superintendence of the apartment of the *hasssekee*; and a few others whose functions are less important.

The white eunuchs do not approach the women: they are employed out of the harem, and in the particular service of the sultan. They have the charge of the gates of the seraglio; they superintend and instruct the pages. Their chief is called *capou-aggasi*. (See CAPI-AGA.) For an account of other officers of the seraglio, see BOSTANGI-BASCHI, ICHOGLANS, and CAPIGI.

Balzac observes, that the seraglio at Constantinople is only a copy of that which Solomon anciently built at Jerusalem, for his wives and concubines. For a particular description

description of the seraglio, see Greave's Works, vol. ii. p. 591, &c.

SERAI, in *Geography*, a town of Asiatic Turkey, in Natolia; 24 miles E. of Castamena.—Also, a town of the desert of Syria; 30 miles E. of Aleppo.—Also, a town of Hindoostan, in the circar of Naderbar; 20 miles S.S.W. of Naderbar.

SERAING, a town of France, in the department of the Ourte, and chief place of a canton, in the district of Liege. The place contains 2503, and the canton 6400 inhabitants, on a territory of $92\frac{1}{2}$ kilometres, in 7 communes.

SERAJO, or BOSNA SERAJO, a town of European Turkey, in Bosnia, situated on the river Bosna, and the residence of a sanjiac. It is large, rich, and commercial, and the see of a Catholic bishop, appointed by the king of Hungary; 118 miles W. of Belgrade. N. lat. $44^{\circ} 26'$. E. long. 18° .

SERAKINO, a small Greek island, which, together with *Dromi*, afford a place of shelter to navigators.

SERAMICA, a river of Surinam, which runs into the Atlantic. N. lat. $5^{\circ} 54'$. W. long. $55^{\circ} 38'$.

SERAMPOUR, a town of Hindoostan, near the river Hoogly; 12 miles N. of Calcutta.—Also, a town of Hindoostan, in the country of Bahar; 75 miles S.S.E. of Bahar.—Also, a town of Bengal; 40 miles S. of Dacca. N. lat. $23^{\circ} 4'$. E. long. $90^{\circ} 40'$.—Also, a town of Bengal; 20 miles S.S.E. of Curruckdeah. N. lat. $24^{\circ} 6'$. E. long. $86^{\circ} 28'$.—Also, a town of Bengal; 37 miles N.W. of Burdwan.

SERANGAN, a cluster of three small islands in the East Indian sea; one of them about 15 miles long and 3 broad, and the other two smaller. N. lat. $5^{\circ} 25'$. E. long. $125^{\circ} 20'$.

SERANGODES, a word used originally as an epithet for the pumice-stone, and expressing cavernous, spongy, or full of holes. It has been hence applied to sinuous ulcers, and to all sorts of things that are cavernous, or of a spongy texture.

SERAPGUNGE, in *Geography*, a town of Bengal; 28 miles N. of Mauldah.

SERAPH, or SERAPHIM, in the *Hierarchy of Angels*, a spirit supposed to be of the first or highest rank.

The seraphs, or rather seraphim, make that class of angels, supposed to be the most inflamed with divine love, by their nearer and more immediate attendance on the throne, and to communicate their heat to the inferior and remoter orders: hence their name, which is formed from the Hebrew root שרף , *to burn, inflame*.

SERAPH is also said to be the name of a Turkish gold coin, worth about 5s. sterling.

SERAPH'S HEAD, in *Heraldry*, is used to denote a child's head, with three pair of wings, *viz.* two in chief, two in fesse, and two in base.

SERAPHIC, something belonging to the seraphim.

Mr. Boyle has a treatise of seraphic love, *i. e.* of divine love, or the love of God.

In the schools, St. Bonaventure is called the Seraphic Doctor, from his abundant zeal and fervour.

St. Francis, founder of the Cordeliers and Franciscans, is called the Seraphic Father, in memory of a vision he saw on mount Alverna.

SERAPHIM. See SERAPH.

SERAPHIM, *Order of*, in *Heraldry*, otherwise furnamed of *Jesus*, was instituted in Sweden, in 1334, by Magnus II. king of Sweden, in memory of the siege of the metropolitan city of Upsal; and not, as some authors say, by Eric the Great, called Smeek; nor by Gustavus I., as others ima-

gine. Upon the change of religion which happened in Sweden, under Charles IX., this order was abolished; but it was revived, February the 11th, in the year 1748, by Frederic I., king of Sweden. The *habit* of the order is a white fatten jacket, trimmed with black lace, and lined with black; with white breeches, shoes, and stockings, trimmed with black, and black ribbons; a black fatten short cloak, lined with white, the cape being white, trimmed with black lace; a hat of black fatten, bound with white, having on the left side four white ostrich feathers, and in the middle of them one black feather. Upon the left breast of the cloak is a star of eight points, embroidered in silver; and upon the jacket, on the same side, is the like star, but somewhat less in size. The *collar* of the order is composed of eleven golden heads of seraphs, with wings expanded, and eleven blue patriarchal crosses, enamelled on gold, all joined with chains of the last. To the collar is suspended the *ensign* of the order, *viz.* a star of eight points, enamelled white, the centre blue, with the arms of Sweden, and the initial letters, I.H.S.; over the H. a cross; the arms inclosed with four seraphs' heads, as in the collar; in the arms, under the bottom crown, the passion-nails. N.B. The seraphs' heads are between the double points of the star; and over the upward points is the royal crown of Sweden, by which it is pendant to the collar. The *ensign* also is pendant to a broad sky-blue watered ribbon, worn scarf-wise, and brought over the right shoulder, and under the left arm.

SERAPIAS, in *Botany*, one of the poetic names, derived from Serapis, the Egyptian idol. The *Serapias* of Pliny was evidently, from his description, a plant of the *Orchis* tribe, with globular roots, and supposed to have an aphrodisiac quality. Hence Linnæus retains the above name for a genus of the same natural order, which, according to his characters and ideas, was more ample than botanists at present make it, including many species of our *EPIPACTIS*. (See that article.)—Linn. Gen. 462. Schreb. 603. Willd. Sp. Pl. v. 4. 70. Mart. Mill. Dict. v. 4. Swartz Act. Holm. for 1800. 223. t. 3. f. H. Schrad. New Journ. v. 1. 47. t. 1. f. H. Juss. 65. Brown in Ait. Hort. Kew. v. 5. 194. Sm. Prodr. Fl. Græc. Sibth. v. 2. 218.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Gen. Ch. *Cal.* Perianth superior, of three ovate, pointed, concave, converging, equal leaves. *Cor.* Petals two, lanceolate, acute, smaller than the calyx, and concealed within it. Nectary a lip, without a spur; concave at the base; its terminal lobe largest, undivided, pointed, dependent. *Stam.* Filament none; anther oblong, erect, attached in a parallel manner to the fore part of the style, of two cells, opening in front; the masses of pollen club-shaped, attaching themselves, each by its taper base, to a gland by the stigma, in one and the same pouch; *Brown. Pist.* Germen inferior, obovate, furrowed; style elongated, erect, with a taper point extended above the anther; stigma in front, below the anther, concave. *Peric.* Capsule obovate, of one cell, with three ribs, bursting longitudinally between the ribs. *Seeds* very numerous, minute, roundish, each with a chaffy tunic.

Eff. Ch. Calyx converging. Nectary a lip without a spur; concave at the base; its terminal lobe very large, dependent, undivided. Anther parallel to the style, furnished by a point.

1. *S. Lingua*. Tongue-lipped Serapias. Linn. Sp. Pl. 1344. Willd. n. 1. Ait. n. 1. Sm. Fl. Græc. Sibth. t. 931, unpublished. (Orchis n. 1267; Hall. Hist. v. 2. 135. *O. macrophylla*; Column. Ecphr. 321. t. 322. *O. montana italica*, linguâ oblongâ, altera; also linguâ trifidâ; Rudb.

Rudb. Elyf. v. 2. 204. Orchides Etruriæ; Petiv. Gazoph. t. 128. f. 1—3? Testiculi species tertia; Matth. Valgr. v. 2. 233. f. 1. Dalech. Hist. 1551.)—Lateral segments of the lip erect; middle one ovate, smooth.—Native of open mountainous situations in the south of Europe. Dr. Sibthorp gathered it in Zante, as well as in Greece, and we readily assent to the opinion of a learned German writer, in the Allgemeine Literatur-zeitung, for June 1807, n. 133. 1060, that this plant, and not *Iris tuberosa*, is probably the true *Λογχιτις* of Dioscorides. The root consists of two stalked, roundish knobs, like others of this tribe, but rather smaller. Stem a foot high, clothed in the lower part with lanceolate, sheathing, smooth leaves. Spike of from two to eight flowers, with a large, concave, purplish-grey bractea to each. Calyx ribbed, of the same colour as the bracteas, and pointed like them, three quarters of an inch long. Lip twice that length; its disk whitish, with a dark red, oblong, undivided elevation at the base, and two rounded, erect, lateral lobes, of the same colour; the central lobe dependent, ovate, pointed, undulated, purplish, veiny, smooth. Haller justly refers both the above synonyms of Rudbeck to this species.

2. *S. cordigera*. Heart-lipped Serapias. Linn. Sp. Pl. 1345. Willd. n. 2. Ait. n. 2. Sm. Fl. Græc. Sibth. t. 932, unpublished. Andr. Repof. t. 475. (Orchis montana italica, flore ferrugineo, linguâ oblongâ; Rudb. Elyf. v. 2. 203. f. 18. O. Etruriæ, linguâ ferrugineâ pilosâ; Petiv. Gazoph. t. 128. f. 4.)—Lateral segments of the lip erect; middle one heart-shaped, hairy.—More frequent than the foregoing in the south of Europe, and north of Africa, in the same kind of situations. We gathered it in July 1787, in pastures at St. Orfese, near Genoa. The whole plant, especially the bulbs and flowers, are larger than in *S. Lingua*, and the whole spike is of a more dingy hue. The colour, however, of the different parts is variable in both. The broad hairy lip of *cordigera*, with a divided glandular elevation at its base, is sufficiently characteristic. We trust we are right in the citation of Rudbeck, and that he misquotes Matthioli.

Willdenow's *S. oxyglottis*, founded solely on Petiver's t. 128. f. 5 & 6, appears to us too uncertain to be adopted, though we doubt not that some distinct species of this order, and perhaps of this genus, are still latent in Italy.

SERAPIAS, in the *Materia Medica*, the officinal name of the dried root, called *salep*.

SERAPION, of Alexandria, in *Biography*, lived about the year 280 before Christ, or in the 125th Olympiad, and is affirmed by Celsus to have been the founder of the empiric sect of physicians, and accused by Galen of vaunting himself, and of maltreating the character of Hippocrates. (See EMPIRIC.) He was probably a contemporary of Philinus, to whom also the origin of the same sect has been attributed. See Celsus, Præf.

SERAPION, JOHN, or JOHN, the Son of Serapion, an Arabian physician, lived between the time of Mesue and Rhazes, and was probably the first writer on physic in the Arabic language; for it appears that Mesue, like his predecessor Aaron, or Ahrun, wrote in the Syriac tongue. Haly Abbas, when giving an account of the works of his countrymen, describes the writings of Serapion, as containing only an account of the cure of diseases, without any precepts concerning the preservation of health, or relating to surgery; and he makes many critical observations, which, Dr. Freind observes, are sufficient proofs of the genuine existence of the works ascribed to Serapion, from their truth and correctness. Rhazes also quotes them frequently in his "Continent." Serapion must have lived towards the

middle of the ninth century, and not in the reign of Leo Isaurus, about the year 730, as some have stated. One circumstance remarkable in Serapion, Dr. Freind observes, is, that he often transcribes the writings of Alexander Trallian, an author with whom few of the other Arabians appear to be much acquainted. This work of Serapion has been published, in translations, by Gerard of Cremona, under the title of "Practica, Dicta Breviarum;" and by Torinus, under that of "Therapeutica Methodus." See Freind's History of Physic, and Sprengel Geschichte der Arzneykunde, ii. 365.

Some confusion appears to exist respecting another SERAPION, whom Sprengel calls the younger, and places 180 years later than the former, and who was probably the author of a work on the materia medica, entitled "De Medicamentis tam simplicibus, quam compositis." This work bears intrinsic evidence of being produced at a much later period, since authors are quoted who lived much posterior to Rhazes. It is probable that this work, which must obviously have been composed in the latter part of the eleventh century, (for Avenzoar, who wrote in that century, is quoted in it,) is the same with that which is often cited by Constantine, the African, under the name of Joannes Damascenus, a name which some authors have erroneously given to the elder Serapion, instead of the subject of the present article; and some to Mesue; to the latter of whom Freind has shewn that it could not belong. See Freind and Sprengel, as above quoted.

SERAPIONIS Portus et Promontorium, in *Ancient Geography*, a port and promontory of Ethiopia, between Essina emporium and Tonice emporium, according to Ptolemy.

SERAPIS, in *Mythology*, an Egyptian deity, who was worshipped under various names and attributes, as the tutelary god of Egypt in general, and as the patron of several of their principal cities.

Tacitus informs us, that he was worshipped as a kind of universal deity that represented Esculapius, Osiris, Jupiter, and Pluto; and he was sometimes taken for Jupiter Ammon, the Sun, and Neptune; and the honours that were rendered to him at Alexandria were more solemn and extraordinary than those of any other place.

Learned writers have differed in opinion as to the time of the introduction of this deity into Egypt: some have supposed that he was known and worshipped in this country long before the time of the First Ptolemy, and that he was the same with their Apis; *Serapis* being no other than *Apis en Soqer*, i. e. *Apis in his coffin*. Accordingly, they say, that while the sacred bull, which the Egyptians worshipped for their great god, was alive, he was called *Apis*; and that when he was dead and buried in his coffin, he was called *Serapis*, that is, *Apis in soro*, and thus they derive his name by corruption from *soroapis*: and some have even imagined that the patriarch Joseph was worshipped under this title; but to this etymology it has been objected, that as the Ptolemies first brought the Greek language into Egypt, if Serapis had been an ancient god worshipped in that country before the Ptolemies reigned there, his name could not have had a Greek etymology.

According to the learned Mr. Bryant, *far* signified any thing noble; and Osiris, the great husbandman, who had been exposed in an ark, was styled *far-apis*, which signifies *illustris genitor*, the great father of mankind. But, he observes, that there was likewise the term *for*, from whence came the σορος of the Greeks, which signified a bier or coffin, and also a place of interment. Hence the temple where the dead Apis was deposited, had the name of *Sor-apis*, rendered inaccurately *farapis*.

Plutarch,

SERAPIS.

Plutarch, who did not know this distinction, fancied that some people in Egypt would not allow forapis to have been a god: the dispute was about the sound of a word: no Egyptian could deny the divinity of the god Serapis, but *Sor-apis* had another meaning; and this was the term in debate. Upon the whole he concludes, that the dæmon, or deified man, was *Sar-apis*, and that *sor-apis* was the tomb of Apis. Analysis of Ancient Mythology, vol. ii. p. 428.

Others have maintained, that Serapis was not originally an Egyptian deity, anciently worshipped in that country, but an adventitious god brought thither from abroad. The ancient place of his station, according to Polybius, was on the coast of the Propontis, on the Thracian side, over-against Hieras; and there Jason, when he went on the Argonautic expedition, sacrificed to him. Thence his image was brought to Sinope in Pontus; and from Sinope, Ptolemy, the first of that name, in obedience, as it is said, to a supernatural direction, brought it to Alexandria, and set it up in one of the suburbs of that city, called *Rhacotis*, where it was worshipped by the name of Serapis; and this new god had in that place, soon after, a very famous temple erected to him, called the *Serapeum*. This temple, says Ammianus Marcellinus, did, in the magnificence and ornaments of its buildings, exceed all other edifices in the world, next to that of the Capitol at Rome. Hence Serapis became the god of the court, and led the Egyptians almost to forget their ancient gods. The provinces vied with each other in building temples to him, and burning incense on his altars. The most ancient temple, according to Pausanias, was that at Memphis.

And this, say the advocates of this opinion, was the first time that this deity was either worshipped or known in Egypt.

Ptolemy found great difficulty in obtaining this image; but the inhabitants of Sinope, being oppressed with a grievous famine, were relieved by Ptolemy with a fleet of corn, and in return they consented to part with the image of their god.

The statue of Serapis, according to Macrobius, was of a human form, with a basket or bushel on his head, resembling plenty, and referring, as some say, to the history of Joseph's supplying the Egyptians with corn; or, according to others, to the relief of Sinope by Ptolemy: his right hand leaned on the head of a serpent, whose body was wound round a figure with three heads, of a dog, a lion, and a wolf; in his left he held a measure of a cubit length, as it were to take the height of the waters of the Nile.

Those who maintain that Serapis was a foreign god, unknown to the Egyptians before the time of the Ptolemies, argue, that Herodotus, who dilates in his account of the Egyptian gods, makes no mention of Serapis; which he probably would have done, if he had been one of the great gods of that people. Moreover, the Isiac table, upon which so many Egyptian deities appear, presents us with nothing that resembles Serapis. Besides, Tacitus relates, that Serapis appeared in a dream to Ptolemy, under the figure of an exquisitely beautiful young man, and ordered him to send two of his most faithful friends to Sinope, a city of Pontus, where he was worshipped, and to bring his statue from thence. Ptolemy, having communicated this vision, deputed a select embassy to Sinope, and from thence the statue of that god was brought. Hence it is concluded that he was unknown in Egypt before this event.

On the other hand, those who contend that Serapis was one of the great gods of Egypt, where he was worshipped before the time of the Ptolemies, allege, that before the testimony of Tacitus can be admitted, it must be proved

that Serapis was the deity actually worshipped at Sinope, whereas, they say, that the god to whom that city paid adoration was Pluto; and that the name Serapis was not given to him till his statue was brought into Egypt. Plutarch testifies, that he had not that name when he came into Egypt; but upon his arrival at Alexandria, he took the name which the Egyptians gave to Pluto, which was Serapis. When Pausanias relates, that the Alexandrians received from Ptolemy the worship of Serapis, he says, at the same time, that there was already at Alexandria a very magnificent temple of that god; and another, not so grand, but of great antiquity, in the city of Memphis. Tacitus himself, when he says that Ptolemy, after Serapis was brought into Egypt, built a stately temple to him in the place named Rhacotis, asserts also, that there was another smaller one, consecrated to the same god, and to Isis; which proves, not that Serapis was not worshipped in Egypt till the time of the embassy to Sinope, but only that the worship of that god, perhaps neglected for a long time, was re-established there with solemnity. The silence of Herodotus, and the omission in the Isiac table, may be accounted for by the following considerations. Though it is true that Herodotus set apart his second book for the history of the Egyptian religion, yet we cannot be sure that he has omitted none of their gods. Besides, having spoken fully of Osiris, who was perhaps the same with Serapis, he might think it needless to say any thing particularly of the latter. The same observation is applicable to the Isiac table. Although a great number of the Egyptian gods may be found there, yet it cannot be affirmed that they are all there, and much less that they can all be distinguished by their particular symbols. The proof drawn from the diversity of representations is yet less conclusive. The Egyptians varied exceedingly with respect to the figures of their gods, and the symbols annexed to them. The figures frequently bore a vast number of attributes, which could not agree to a single divinity. These are what have been called the Pantheon figures, which represented several deities; as any one may be convinced by viewing some of those of Isis, of Harpocrates, and others. From these and some other considerations, many learned men have inferred that Serapis was an Egyptian god, known and worshipped by that people long before the time of the Ptolemies; and that he was the same with Pluto; and though the testimonies of Tacitus and Plutarch, above cited, were less conclusive than they are, yet one of the finest statues of that god, at whose feet we see the three-headed Cerberus, would leave no room to doubt. See a print of this figure in Montfaucon's Antiquity, tom. ii. p. 185. Antiquarians have furnished us with several other figures, always known to be those of Serapis by the calathus, or a kind of bonnet which he wore upon his head. Sometimes he is joined with Isis, and represented like a young man, and then he is taken for Osiris or the Sun: frequently like a bearded old man, very much resembling Jupiter, whose name he also bore; at least, from the time that the Greeks became masters of Egypt. Varro says, that there was a law which forbade saying, under pain of death, that Serapis had been a mortal man.

We shall here add, that Osiris was variously represented, sometimes by a sceptre and eye, to express his power and providence; at other times, by the image of a hawk, because of its sharp sight, swiftness, and other qualities; and in later times, in a human form, in a posture not very decent, signifying his generative and nutritive faculty; but the greatest adoration was paid to his living image, the bull.

The image of Isis was usually in the form of a woman, with cow's horns on her head, representing the appearance

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of the moon in her increase and decrease, and holding the sistrum (a kind of cymbal) in her right hand, and a pitcher in her left; the former signifying the perpetual motion there is in nature, and the other the fecundity of the Nile. But sometimes she was represented as Cybele, having her body full of breasts, to express her nourishing of all things.

It is observed, that when Serapis was introduced into Egypt, at the period above-mentioned, as writers have inferred from the silence of Herodotus, and of other authors who wrote before the times of the Ptolemies, he brought in with him among the Egyptians, a new way of worship: for till the time of the Ptolemies, the Egyptians never offered any bloody sacrifices to their gods, but worshipped them merely with their prayers and frankincense; but the tyranny of these princes having forced upon them the worship of two foreign gods, *viz.* Saturn and Serapis, they in this worship first introduced the use of bloody sacrifices among that people. And so averse were the Egyptians to this mode of worship, that they would never suffer any temple to be built to either of these gods within any of the walls of their cities, but they were always erected in their suburbs: and they seem to be only Egyptians of the Greek original who conformed to this practice, and not those of the old race. See Exod. viii. 26, 27. Prid. Conn. vol. iii. p. 15, &c.

The famous temple of Serapis at Alexandria was destroyed by order of Theodosius; and the celebrated statue of this deity was broken in pieces, and its limbs carried first in triumph by the Christians through the city, and then thrown into a fierce fire, kindled for that purpose in the amphitheatre. As the Egyptians ascribed the overflowing of the Nile, to which was owing the fertility of that country, to the benign influence of their god Serapis, they concluded, that, now he was destroyed, the river would no longer overflow, and that a general famine would ensue; but when they observed, on the contrary, that the Nile swelled to a greater height than had been known in the memory of man, and thereby produced an immense plenty of all kinds of provisions, many of the pagans, renouncing the worship of idols, adored the God of the Christians. Ancient Univ. Hist. vol. vi. p. 417.

The figure of Serapis is found on many ancient medals.

SERAPIU, in *Ancient Geography*, a place of Egypt, beyond the Nile, between Hero and Clifmo, according to the Itinerary of Antonine.

SERAQUINO, in *Geography*, an island in the Grecian Archipelago; 8 miles N.E. of Scopelo.

SERARIUS, NICHOLAS, in *Biography*, a learned Jesuit, was born at Rambervilliers, in Lorraine, in 1555. He studied at Cologne, where he entered into the society of the Jesuits, and afterwards was for twenty-four years a professor of the languages of philosophy and theology at Wurtzburg. He died at Mentz in 1609, having, besides his employment in teaching, occupied himself in the composition of a vast number of works, which were printed collectively at Mentz, in 3 vols. folio. Of these, the most esteemed were "Commentaries on several Books of Scripture:" "Prolegomena on the Holy Scriptures:" "Trihæresium, seu de celeberrimis tribus, apud Judæos, Phariseorum, Sadduceorum, et Essenorum Sectis." This last work was afterwards printed at Delft, with the addition of the treatises of Drusus and Scaliger on the same subject. Serarius was a strenuous defender of the church of Rome against the reformers, and wrote several works against Luther and his followers. Cardinal Baronius gives him the title "of the luminary of the Germanic church." Dupin says, that the Prolegomena of Serarius have a great deal of erudition, but that he handles his questions in too scholastic

a manner, and mixes up too much controversy in them: he thus sums up the literary character of this author: "Serarius," says he, "was very learned, and well versed in the languages, and in topics relating to the Holy Scriptures: he is not equally exact in ecclesiastical history, nor equally powerful in controversy. He wrote with ease, but without politeness. In treating on a subject, he often descends to impertinent and tedious trifling, and sometimes wanders from the point to attack the Protestants, and discuss controversial questions."

SERASAPOUR, in *Geography*, a town of Hindoostan, in Bahar; 18 miles W. of Bahar.

SERASKER, a Turkish word, composed of *ser*, which in Persian signifies *head*, and *asker*, *i. e.* *soldiers*. This is a military degree, that admits of no superior, somewhat like generalissimo, and is a title given to those who command on the frontiers, or are detached with a considerable body of troops.

SERASPAIRE, in *Ancient Geography*, a town of Asia, in the Lesser Armenia, and in the prefecture of Rhanena, according to Ptolemy.

SERASS, in *Ornithology*, a bird of the same genus with the *colum*, which comes yearly to Surat in the East Indies, from mount Caucasus, and distinguished by a plication of the asperia arteria; which is designed to answer similar purposes with that of the colum.

SERAT, SERED, or *Sfered*, in *Geography*, a town of Hungary, on the river Waag; 27 miles E. of Presburg.

SERATZ, a town of Sclavonia; 28 miles N.W. of Pofzega.

SERAVAN, in *Ornithology*, the name given by Buffon to the *LOXIA Astrild*, which see.

SERAUCOURT, in *Geography*, a town of France, in the department of the Aisne; 6 miles S. of St. Quinten.

SERAVI, a town of Egypt, on the E. branch of the Nile; 21 miles N. of Cairo.

SERAUSTEH, a town of Candahar; 30 miles S.W. of Cabul.

SERAY, a town of Hindoostan, in Bahar; 12 miles N. of Chuprah. N. lat. 25° 18'. E. long. 84° 53'.—Also, a town of Hindoostan, in Boggilcund; 20 miles W. of Rewah.

SERAYA, a town of Hindoostan, on the right bank of the Jumnah; 42 miles S.E. of Agra.—Also, a town of Hindoostan, in Bahar; 20 miles S. of Bettiah. N. lat. 26° 28'. E. long. 84° 53'.

SERBADJE, a town of Egypt, on the E. bank of the Nile; 20 miles N. of Cairo.

SERBAJEE, in the *Eastern Military Orders*, is a captain in the horse in the service of the grand seignior.

SERBAR, in *Geography*, a town of Persia, in the province of Mekran; 50 miles N.N.W. of Kidge.

SERBATIC, YISSER, in *Ancient Geography*, a river of Africa, in the eastern part of Mauritania Cæsariensis, which discharged itself into the Mediterranean, to the E. of Rufgunia colonia. Ptolemy places its mouth between Modunga and Cissa.

SERBI, a people of Asiatic Sarmatia, who dwelled with the Orinxi and Vali, between the Ceraunian mountains and the river Rha, according to Ptolemy.—Also, a people called likewise Scythians, who inhabited a territory towards Dalmatia.

SERBINUM, a town of Lower Pannonia, along the Danube.

SERBONIS LAGUS, or *Serbonite lake*, a lake which was situated between Egypt and Palestine, near mount Casius;

Æus; and which by different authors has been assigned to Egypt, Syria, Palestine, or Judea.

Pliny says that it was 150 miles long. Strabo assigns to it 200 stadia of length, and 50 of breadth. It had communicated with the Mediterranean by an opening which was filled up in the time of Strabo. The fable says that Typhon lay at the bottom of this lake, and the Egyptians called its opening the breathing-hole of Typhon.

SERBORA. See SCHERBRO.

SERBORI LAKE. See DEAD SEA.

SERBURA, the name of a dog, assigned by the mythological legends of the Hindoos, as an attendant on Yama, the regent of their infernal regions. The name means varied, or spotted, and reminds us of the three-headed Cerberus of western fable. It might as well be written Cerbura; and when we add that another of his names is Trisiras, or three-headed, and that he is so represented, we can no longer doubt of their identity, and of the fable of one nation being borrowed from the other, or both from a common source. See TRISIRAS, and YAMA.

SERCELLI, in *Geography*. See SHERSHELL.

SERCHIO, a river which rises in the duchy of Modena, and after traversing the state of Lucca, runs into the Mediterranean, 4 miles N.N.W. of Pisa.

SERD, a town of Persia, in the province of Adirbeizan; 15 miles N. of Tabris.

SERDAN, a town of Persia, on the Kerman; 83 miles S.S.W. of Kin.

SERDAO, O, town of Portugal, in the province of Alentejo; 30 miles W.N.W. of Ourique.

SERDAPOL, a town of Hungary; 2 miles S. of Serat.

SERDOB, a town of Russia, in the government of Saratov, on the Donetz, near its source; 72 miles N.W. of Saratov. N. lat. $52^{\circ} 30'$. E. long. $54^{\circ} 44'$.

SERDOBOL, a town of Russia, in the government of Viborg, on the lake Ladoga; 60 miles N.N.E. of Viborg. N. lat. $61^{\circ} 45'$. E. long. $30^{\circ} 14'$.

SERDZE KAMEN, a cape on the N.E. coast of Russia, in the Frozen sea, so called from its supposed resemblance to a heart. N. lat. $67^{\circ} 3'$. E. long. $170^{\circ} 25'$.

SERE, in *Falconry*, the yellow between the beak and eyes of a hawk.

SERE, in *Geography*, a river of Spain, which runs into the sea, 6 miles S. of Peniscola.

SEREA, a town of Abyssinia, near lake Dembea; 90 miles E.N.E. of Miné.

SEREBRIANKA, a gulf of Russia, on the W. coast of Nova Zembla. N. lat. $75^{\circ} 25'$. E. long. $52^{\circ} 14'$.

SEREC, a town of Persia, in the province of Segestan, or Seiltan; 84 miles S.S.W. of Kin.

SERED, SERT, or *Sabert*, a town of Kurdistan, on the Tigris, S. of Zok, supposed to be the ancient Tigranocerta, a city built by Tigranes, and intended by him for the capital of Armenia, and peopled with inhabitants collected from all parts of Asia. It was taken and plundered by the Romans under Lucullus in the year 69 B.C. It is now peopled by 5000 Kurds, Syrians, and Chaldeans, and governed by a prince subject to that of Zok; 75 miles S.E. of Diarbekir.

SERED. See SERAT.

SEREEK, a town of Persia, in the province of Mekran, and the residence of the chief of Jask; it contains a large mud fort, and 600 huts, situated four miles from the sea, and six from the hills. The country between Jask and this place contains numerous plantations of palms, and abundance of wheat. Jask is tributary to the Imam of Muscat, and pays 2500 rupees a-year. It lies two miles from the sea,

VOL. XXXII.

and eight from the hills, and the town consists of 250 huts, defended by a mud fort.

SEREGIPPE. See SERGIFE.

SEREGNAN, a town of Tyrol; 8 miles N.N.E. of Trent.

SEREGNO, a town of Italy, in the duchy of Milan; 10 miles N. of Milan.

SEREIL *Feathers of a Hawk*, the name which answers to pinions in any other fowls.

SEREJON, in *Geography*, a town of Spain, in the province of Eltramadura; 20 miles S. of Plafencia.

SERENA, LA, a town of Spain, in the province of Eltramadura; 18 miles E.S.E. of Merida.

SERENA, a river of Chili, which runs into the South Pacific ocean, near *Cogimbo*; which see.

SERENA, *Gutta*, in *Medicine*, the same as amaurosis. See GUTTA *Serena*.

SERENADE, an evening concert, given by a lover under the window of his mistress. It generally consists of instrumental music; sometimes, however, vocal is added. These pieces in Italy are also called *serenate*. The mode of serenades, says Rousseau, has been long discontinued, unless by the common people; and its discontinuance is to be lamented. The silence of the night, which banishes all distraction, gives music additional charms, and renders it more delicious. In the summer of 1770, this was not the case at Venice, six years after Rousseau's Dictionary was written; as we find in our journal, during the month of August of that year, the following memoranda. "The people here (at Venice) during summer, seem to begin to live only at midnight. Then the canals are crowded with gondolas, and St. Mark's square with company; the banks too of the canals are all peopled, and harmony prevails in every part. If two of the common people walk together arm in arm, they seem to converse in song; if there is company on the water, in a gondola, it is the same; a mere melody, unaccompanied with a second part, is not to be heard in the city: all the ballads in the streets are sung in duo. Luckily for us, this night, August 7th, a barge, in which there was an excellent band of music, consisting of violins, flutes, horns, bafes, and a kettle-drum, with a pretty good tenor voice, was on the great canal, and stopt very near the house where we lodged; it was a piece of gallantry, at the expence of an *inamorato* in order to serenade his mistress. Shakspeare says of nocturnal music,

"Methinks it sounds much sweeter than by day.

Silence bestows the virtue on it—I think

The nightingale, if she should sing by day,

When every goose is cackling, would be thought

No better a musician than the wren."

Whether the time, place, and manner of performing this music, gave it adventitious and collateral charms, we will not pretend to say; but all we know is, that the symphonies seemed to us to be admirable, full of fancy, full of fire; the passages well contrasted; sometimes the graceful, sometimes the pathetic prevailed; and sometimes, however strange it may be thought, even noise and fury had their effect.

SERENE, SERENUS, a quality or title of honour given to certain princes, and chief magistrates of republics.

The king of England is styled, *the most serene*; the same term is also applied to the doge of Venice. The pope and the sacred college, writing to the emperor, to kings, or the doge, give them no other title but that of *most serene*. Indeed the Venetians set the title of serenity above that of highness.

In 1646, Wicquefort observes, there was a clashing between the courts of France and Vienna, because the emperor refused

refused the king of France any other title than that of serene. Bishops also were anciently addressed under the title of serene.

The kings of France, of the first and second race, speaking of themselves, use no other quality but *notre sérénité*.

The emperor gives no other title to the king of England, nor even to any other king, excepting the king of France.

The king of Poland, and other kings, give it to the electors. The emperor, writing to the electors, or other princes of the empire, only uses the term *dilection*; but in treating with them he uses *electoral serenity* to the electors, and *ducal serenity* to the other princes.

SERENE, in *Geography*, a small island in the Red sea. N. lat. $19^{\circ} 30'$. E. long. $39^{\circ} 50'$.

SERENT, a town of France, in the department of the Morbihan; 13 miles N.E. of Vannes.

SERENUS, SAMMONICUS, QUINTUS, in *Biography*, a Roman physician in the reigns of Severus and Caracalla, who was assassinated at a banquet by the order of the last mentioned emperor. He left an immense library, said to contain twenty thousand volumes, to his son, who was preceptor to the younger Gordian, to whom he presented this valuable bequest. Serenus was the author of several works on history and the products of nature; and also of a medical work in verse, which has passed through a multitude of editions, under the title of "*Carmen de Medicina*." He was superstitious in the choice of his remedies, and especially in that which he proposed for the *Semitertian fever*, which consisted in wearing about the neck, suspended by a linen thread, a piece of paper, on which was written the word *Abraacadabra* in the form of a triangle. Eloy Dict. Hist. de la Méd.

SERENZ, in *Geography*, a town of Hungary; 9 miles W. of Tokay.

SERERES, a people of Africa, in the vicinity of Cape Verd, dispersed into several small republics, which unite into one body against a common enemy. Their laws are merely those of nature. They wear no clothing, and they have little or no idea of a Supreme Being or future life: nevertheless they seem to be inoffensive, unacquainted with strong liquors, industrious, and hospitable to strangers.

SERES, in *Ancient Geography*, a name given to those people who were situated to the east of India, and who, by the investigations and discoveries of the moderns, are supposed to have inhabited Serica. They were renowned for their justice, according to Mela, and for their longevity of 200 years, according to Strabo. They had an insect which produced silk, says Pausanias. (See SERICA.) People of the same name were also established in the northern part of Taprobana.

SERET, in *Geography*. See SIRET.

SERETIUM, in *Ancient Geography*, a town of Dalmatia. Dion Cassius reports, that Tiberius was obliged to raise the siege of this town, but that it was afterwards taken by the Romans.

SERETKINA, in *Geography*, a town of Russia, in the government of Irkutsk, on the Angara; 24 miles E.S.E. of Balaganikoi.

SERGA, a town of Russia, on the Volga; 40 miles S. of Astracan.

SERGAG, a town of Russia, in the government of Niznei Novgorod; 48 miles S. of Niznei Novgorod. N. lat. $56^{\circ} 51'$. E. long. $45^{\circ} 20'$.

SERGE, in *Commerce*, a woollen quilted stuff, manufactured on a loom with four treddles, after the manner of ranteens, and other stuffs that have the whale.

The goodness of serges is known by the quilting, as that of cloths by the spinning.

Of serges there are various kinds, denominated either from the different qualities of them, or from the places where they are wrought. The most considerable is the London serge, now highly valued abroad, particularly in France, where a manufacture has been carried on with good success, under the title of *serge façon de Londres*.

SERGE, *Manufacture of London*. For wool, the longest is chosen for the warp, and the shortest for the woof. Before either kind is used, it is first scoured, by putting it in a copper of liquor, somewhat more than lukewarm, composed of three parts of fair water and one of urine. After having staid long enough therein for the liquor to dissolve, and take off the grease, &c. it is stirred briskly about with a wooden peel; taken out of the liquor, drained, and washed in a running water, dried in the shade, beaten with flicks on a wooden rack, to drive out the coarser dirt and filth, and then picked clean with the hands. Thus far prepared, it is greased with oil of olives, and the longest part, destined for the warp, is combed with large combs, heated in a little furnace for the purpose. To clear off the oil again, the wool is put in a liquor composed of hot water, with soap melted in it: whence being taken out, wrung, and dried, it is spun on the wheel.

As to the shorter wool, intended for the woof, it is only carded on the knee with small cards, and then spun on the wheel, without being scoured of its oil. Note, the thread for the warp is always to be spun much finer, and better twisted than that of the woof.

The wool both for the warp and the woof being spun, and the thread divided into skains, that of the woof is put on spools (unless it have been spun upon them) fit for the cavity or eye of the shuttle; and that for the warp is wound on a kind of wooden bobbins to fit it for warping. When warped it is stiffened with a kind of size, of which that made of the shreds of parchment is held the best; and when dry is put on the loom.

When mounted on the loom, the workman raising and falling the threads (which are passed through a reed), by means of four treddles placed underneath the loom, which he makes to act transversely, equally and alternately, one after another, with his feet, in proportion as the threads are raised and lowered, throws the shuttle across from one side to the other; and each time that the shuttle is thrown, and the thread of the woof is crossed between those of the warp, strikes it with the frame to which the reed is fastened, through whose teeth the threads of the warp pass; and this stroke he repeats twice or thrice, or even more, till he judges the crossing of the serge sufficiently close: thus he proceeds till the warp is all filled with woof.

The serge now taken off the loom is carried to the fuller, who fulls, or scours it in the trough of his mill, with a kind of fat earth, called fullers-earth, first purged of all stones and filth. After three or four hours scouring, the fullers-earth is washed out in fair water, brought by little and little into the trough, out of which it is taken when all the earth is cleared; then, with a kind of iron pincers, or plyers, they pull off all the knots, ends, straws, &c. sticking out on the surface on either side; and then returning it to the fulling trough, where it is worked with water somewhat more than lukewarm, with soap dissolved therein for near two hours: it is then washed out till such time as the water becomes quite clear, and there be no signs of soap left; then it is taken out of the trough, the knots, &c. again pulled off, and then put on the tenter to dry, taking care as fast as it dries to stretch it out both in length and breadth till it be brought to its just dimensions. When well dried, it is taken off the tenter, and dyed, thorn, and pressed.

SERGEANT. See SERJEANT.

SERGEN.

SERGEIUM, in *Ancient Geography*, a town situated in the interior of Sicily. Ptolemy.

SERGIEV, in *Geography*, a town of Russia, in the government of Tobolsk, on the Enisei; 72 miles N. of Eniseisk.

SERGIEVSK, a town of Russia, in the government of Upha; 180 miles W. of Upha. N. lat. 54°. E. long. 54° 44'.

SERGIEVSKAIA NOVA, a fortress of Russia, in the government of Upha, on the Samara; 56 miles N.W. of Orenburg.

SERGIEVSKOI, a town of Russia, in the province of Ustiug, on the Vim; 52 miles N.E. of Yarensk.—Also, a town of Russia, in the province of Ekaterinburg; 48 miles S.W. of Ekaterinburg.

SERGILUS, in *Botany*, a genus formed by Gærtner, v. 2. 409. t. 174. f. 6, of the Linnæan *Calea scoparia*, Chrysocoma n. 2, Browne Jan. 316. t. 34. f. 4, by the following character.

Calyx somewhat turbinate, imbricated with close-pressed, unequal, slightly membranous scales. Flowers all perfect and fertile, five-cleft. Receptacle naked. Down capillary, tufted at the summit.

The above author remarks that this plant “differs in its receptacle, as well as seed-down, from *Calea*, but from *Chrysocoma* in the seed-down only, so that it is nearest akin to the latter. The leaves seem to be sometimes opposite, but are generally very remote, as well as extremely minute.” The only species known is

1. *S. scoparius*. Native of the coldest mountains of Jamaica. Browne says it has the habit of our European broom, being the only tree of the same appearance, observed by him in that country. Swartz has not noticed this plant. See *CALEA* and *CHRYSOCOMA*.

SERGINES, in *Geography*, a town of France, in the department of the Yonne, and chief place of a canton, in the district of Sens; 9 miles N. of Sens. The place contains 1484, and the canton 10,094 inhabitants, on a territory of 260 kilometres, in 18 communes.

SERGIPE del Conde, a river of Brazil, which runs into the bay of All Saints.

SERGIPE, or *Sergippe*, a captaincy or province of Brazil, which chiefly produces cattle, grain, and tobacco, for which last Brazil is particularly celebrated.—Also, the capital of the district, situated near the coast of the Atlantic, on a river of the same name, which runs into the Atlantic, S. lat. 12°. The town is distant 140 miles from St. Salvador. S. lat. 11° 42'. W. long. 38° 36'.

SERGIUS I., pope, in *Biography*, was descended from a family at Antioch, but was himself born, and brought up at Palermo. He came to Rome in the time of pope Adeodatus, and entering among the clergy of that capital, was ordained priest by Leo II. On the death of Conon, in the year 687, there was a great schism respecting his successor, one party espousing the cause of Theodore the archpriest, and the other that of Paschal the archdeacon. The principal persons of Rome, not being able to bring them to an agreement, concurred in the choice of Sergius, and put him in possession by force. Theodore instantly resigned his claim, but Paschal did not give up his pretensions for a considerable time. He at length, however, submitted. The second year of the pontificate of Sergius was rendered memorable by the arrival at Rome of Ceadwalla, king of the West-Saxons, who came to receive baptism from his hands, and who died soon after he had submitted to that rite. In 691 the emperor Justinian II. assembled a council at Constantinople, in which a number of canons were passed. Five of these were opposed by the pope, among which was one condemning a former canon of the church, that forbade ecclesiastical persons to have any connection with their wives after ordina-

tion. Sergius not only rejected these canons, but on their account invalidated all the proceedings of this council, which so much exasperated the emperor, that he sent his sword-bearer with an order to apprehend the pope, and bring him to Constantinople. The soldiery in Italy, however, standing in so much awe of his holiness, not only refused to suffer violence to be offered to him, but intimidated the sword-bearer, that he dared not execute his commission, and was glad to quit Rome in safety. In 696 Sergius consecrated Willibrod bishop of the Frisians, recommended to him by Pepin the elder, as a person every way adapted to undertake the conversion of that heathen people. Sergius died in the year 701, in the 14th year of his pontificate. He had the reputation of much learning and virtue, and is said to have repaired and enriched several churches, which added, in those times, very much to his celebrity.

SERGIUS II., pope, a Roman, was elected in 844, on the death of Gregory IV. He had a competitor in John, deacon of the Roman church, who took possession of the Lateran, but was expelled by the nobility. Sergius was consecrated immediately after his election, without waiting for the imperial confirmation. Lothaire, the emperor, so much resented this seeming hostility, that he sent into Italy his son Lewis, whom he had declared king of Lombardy, with a powerful army, attended by his uncle Drogo, archbishop of Metz. This prince, after cruelly ravaging the ecclesiastical state, marched to Rome, and entered the city amidst the acclamations of the people. He proceeded to the Vatican church, in great solemnity, with the pope, and was afterwards crowned by the latter as king of Italy. Sergius now gladly took the accustomed oath of allegiance to the emperor, and received a confirmation of his election. This pontificate, short as it was, is marked by the predatory incursions of the Saracens, who sailing up the Tiber, burnt the suburbs of Rome, and pillaged the churches of St. Peter and St. Paul without the walls. Sergius died in 847. The famous *scala-sancta*, or holy stair-case at Rome, was erected during the pontificate of Sergius II.

SERGIUS III., pope, a presbyter of the church, though elected by a party, in 898, after the death of Theodore II., was not able to enter upon the duties of his office. A more powerful party supported John IX., and Sergius was glad to seek his safety by flight from the city. He lay in concealment for seven years, during which he contrived to engage in his interest his relation Adelbert, marquis of Tuscany, by whose assistance he was enabled to expel Christopher, who had forcibly intruded into the pontifical seat, and placed himself there in the year 904. Sergius, who is termed by Baronius, and apparently with good reason, “one of the most wicked of men,” had a scandalous connection with the infamous Marozia, who with her mother Theodora, and her sister of the same name, at that time almost entirely governed Rome, and disposed of the holy see. Marozia, who had already been mistress of the marquis Adelbert, bore a son to the pope, who was afterwards raised to the papal throne under the name of John XI., such is the purity of the holy bishops of the Roman church. Sergius received a solemn embassy from Leo, emperor of the East, on account of the refusal of the patriarch Nicholas to confirm the fourth marriage of Leo, as forbidden by the Greek church. Sergius, as there was no limitation to the number of successive marriages in the Roman church, not only approved the marriage of Leo, but sent legates to Constantinople to confirm it. The patriarch, however, could not be prevailed upon to admit its legality. Sergius died in 911. He rebuilt the Lateran church.

SERGIUS IV., pope, a native of Rome, whose family name is said to have been Peter Buccaporci, or in English,

Hog's-snout, was bishop of Albano at the time of his election to the papal see in 1009, after the death of John XVIII. Little is recorded of the transactions of this pontiff: he sent a legate into France to consecrate a monastery in the diocese of Tours, which the archbishop of that see regarded as an encroachment upon his jurisdiction: he also determined a dispute between the archbishop of Hamburg and the bishop of Verden. He was greatly respected for the mildness of his disposition, and his liberality to the poor. He died in 1012.

SERGIVS I., patriarch of Constantinople, is well known in ecclesiastical history for the support which he gave to the doctrine of the Monothelites. He was a Syrian by birth, and born of parents who adhered to the heresy, as it was denominated, of the Monophysites. He was raised to the patriarchal dignity in the year 610. The emperor Heraclius, being desirous of re-uniting the persecuted Nestorians to the Greek church, and having held conferences with persons of influence in that sect, was assured by them, that there would be no difficulty in terminating the controversy, provided the Greeks would assent to the following proposition, "that in Jesus Christ there was, after the union of the two natures, but one will, and one operation." Sergius thought this proposition might be adopted without the smallest injury to the truth; and without derogating from the authority of the council of Chalcedon, which had condemned the doctrine of a single nature: in consequence of this decision, the emperor issued an edict in the year 630 in favour of the doctrine of the *single-will*. This hope of concord was soon frustrated, by the violent opposition of Sophronius, a monk, and patriarch of the see of Jerusalem, who also endeavoured to gain pope Honorius to his party, but Sergius was beforehand with him, and had persuaded his holiness to approve the doctrine in question. In order to quiet the commotions in the church, Heraclius, in 639 issued an edict composed by Sergius, which was entitled "Ecthesis," or an exposition of the faith in which all controversies on the question "whether in Christ there were one or two operations," were prohibited, though the edict plainly inculcated the doctrine of one will. Sergius died in the same year, and his memory was afterwards anathematized in several councils.

SERGODE, in *Geography*, a town of Hindoostan, in Bednore; 8 miles S.W. of Sacrapatam.

SERGOM, a town of Hindoostan, in Baglana; 25 miles N. of Bassen.

SERGOUR, a town of Hindoostan, in Bednore; 25 miles W. of Sacrapatam.

SERJAN. See SIRGIAN and KERMEN.

SERIANA, in *Botany*, could hardly be supposed to have been designed to commemorate a person of the name of Sergeant; yet such was the intention of Plumier. "The Rev. father Philip Sergeant, a native of Calais, of the order of Minims, in Provence, an able botanist, but more able physician, practised medicine at Rome for 25 years, with so much success, as to gain the high esteem of all ranks of people. His departure from that city caused the deepest regret, but he was welcomed at Paris with no less exultation." Plumier, from whom we take this account, named the genus *Serjania*; but Linnæus, who united it to *Paullinia*, by accident, as it seems, altered the word, as he adopted it for a specific name, to *Seriana*. So it now remains, the genus having been restored by recent authors; nor do the botanical claims of the reverend father appear sufficiently great, to make us solicitous about the precise mode of spelling the name of his plant.—Plum. Gen. 34. t. 35. "Schumacher in Aët. Hist. Nat. Hafn. v. 3. p. 2." Willd. Sp. Pl. v. 2. 464. (Paullinia; Lamarck Illustr.

t. 318. f. 1, 2, 3.) — Class and order, *Ocandria Trigynia*. Nat. Ord. *Tribilata*, Linn. *Sapindi*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of five ovate, concave, spreading, permanent, unequal leaves. *Cor.* Petals four, obovate-oblong, twice the length of the calyx, furnished with claws; two of them more distant than the rest. Nectaries two; one of four oblong scales, inserted into the claws of the petals; the other of four glands at the base of the petals. *Stam.* Filaments eight, simple, shortish; anthers small, ovate, two-lobed. *Pist.* Germen superior, stalked, obovate, with three furrows; styles three, combined at the base, recurved; stigmas simple, obtuse. *Peric.* Capsules three, globose, combined longitudinally, each of one cell, not bursting, dilated at the base into a half-ovate membranous wing. *Seeds* solitary, ovate.

Ess. Ch. Calyx of five unequal leaves. Petals four. Nectaries of four scales and four glands. Capsules three, globose, combined, not bursting, each with a dilated wing at the base. *Seeds* solitary.

Obs. The fruit sufficiently distinguishes this genus from PAULLINIA, see that article, however similar the flowers, and habits of the plants.

1. *S. sinuata*. Willd. n. 1. "Schumacher, as above, t. 12. f. 1." (*S. scandens*, triphylla et racemosa; Plum. Gen. 34. Ic. t. 113. f. 2. *Paullinia Seriana*; Linn. Sp. Pl. 524. Jacq. Obs. fasc. 3. 11. t. 61. f. 2.) — Wings of the capsules dilated below their insertion. Leaves ternate; leaflets ovate-lanceolate, sinuated and toothed.—Native of South America. Neither this, nor any other of the genus, is known in our gardens. The stem is angular, furrowed and downy, climbing by means of tendrils. Leaves alternate, stalked; leaflets about two inches long, veiny, tapering at the base; roughish to the touch, though somewhat shining, above; paler beneath. Flowers small, in compound downy clusters. Wing of each capsule near an inch long.

2. *S. divaricata*. Willd. n. 2. "Schumacher. t. 12. f. 2." (*Paullinia divaricata*; Swartz Ind. Occ. v. 2. 696.) — Leaves twice ternate; leaflets ovate, acute, entire, stalked, shining. Common footstalks without wings. — Native of the woods of Jamaica. Stem climbing to a great height, zigzag, with a few distant slight prickles, angular, smooth. Footstalks two inches long, furrowed, smooth. Leaflets stalked, the stalk of the middle one winged. Tendrils axillary, divided at the extremity. Panicles from the same point, on long stalks, their branches racemose, alternate, spreading. Flowers white.

3. *S. caracasana*. Willd. n. 3. (*Paullinia caracasana*; Jacq. Hort. Schonbr. v. 1. 52. t. 99.) — Wings of the capsules not dilated below their insertion. Leaves twice ternate, leaflets oblong, acute at each end, distantly toothed. Common stalks without wings. — Native of the Caraccas, from whence we presume it was sent by Dr. Mærtner to the stoves at Vienna, where it flowers in the summer. The numerous stems climb by tendrils to a great height. Leaves smooth; leaflets elliptic-oblong, two or three inches in length. Flowers white, in compound cylindrical clusters, each cluster on a long stalk, accompanied by two strong revolute tendrils at the top of the stalk.

4. *S. racemosa*. Willd. n. 4. "Schumacher. t. 12. f. 3." — "Wings of the capsules dilated below their base, somewhat sinuated in front. Leaves twice ternate; leaflets ovate, deeply serrated. — Native of Vera Cruz. Leaves acute. Footstalks scarcely bordered. Panicle (or compound cluster) with two tendrils." Schumacher.

5. *S. spectabilis*. Willd. n. 5. "Schumacher. t. 12. f. 4." — Wings of the capsules dilated below their base. Leaves twice ternate; leaflets obovate; the terminal one abrupt.

Footstalks winged.—Native of the West Indies. Communicated by sir J. Banks, from Miller's herbarium. This has much of the habit of *S. caracasana*, but the winged *footstalks*, and obtuse *leaflets*, distinguish it essentially. We do not find any *tendrils* under the *flowers*, as Schumacher describes them, nor are the *leaflets*, as Willdenow says, quite entire.

6. *S. mexicana*. Willd. n. 6. (*Paullinia mexicana*; Linn. Sp. Pl. 525, excluding Plumier's and Hernandez synonyms. "Schumach. t. 11. f. 3.")—Leaves twice ternate; leaflets obovate, entire, all emarginate. Footstalks winged. Clusters aggregate.—Native of Mexico. Akin to the last, but the entire *leaflets*, and compound *inflorescence* distinguish it. The *clusters*, each of which is simple, are ranged alternately, in one large *panicle*. Willdenow says Schumacher's figure is taken from the specimen in the Linnæan herbarium. With this Linnæus at one time confounded the true *Paullinia curassavica*, to which the figure of Hernandez better answers. The Linnæan specimen wants fruit, and yet its habit, colour, and leading characters, are so near the *Seriana* we have just been describing, that there can scarcely be a doubt of its belonging to this genus.

7. *S. angustifolia*. Willd. n. 7. (*S. scandens*, *enneaphylla* et *racemosa*; Plum. Gen. 34. Ic. t. 113. f. 1.)—Leaves twice ternate; leaflets linear-lanceolate, acute, entire. Footstalks winged.—Native of South America.

Nothing can be less like the last, with which Linnæus confounds this narrow-leaved species, whose *clusters* moreover are solitary. We know it only from Plumier's figure.

8. *S. lupulina*. Willd. n. 8. "Schumach. t. 12. f. 5."—"Wings of the capsules half-oval. Leaves twice ternate, crenate, rusty beneath; the terminal leaflets nearly rhomboid; the lateral ones ovate. Footstalks slightly winged."—Native of South America. *Clusters* almost simple, the length of the leaves, and accompanied by two *tendrils*. Schumacher.

9. *S. lucida*. Soland. MSS. Willd. n. 9. "Schumach. as above, p. 128."—"Wings of the capsules half-oval. Leaves twice ternate; leaflets ovate, acute, ferrated. Footstalks scarcely winged.—Native of Santa Cruz. The upper surface of the *leaves* is highly polished, and strongly veined. *Clusters* in some measure compound, accompanied by two spiral *tendrils*. Communicated by sir J. Banks, to the younger Linnæus.

10. *S. triternata*. Willd. n. 10. (*S. scandens*, *polyphylla* et *racemosa*; Plum. Gen. 34. Ic. t. 112. *Paullinia triternata*; Linn. Mant. 236. Jacq. Obs. fasc. 3. 11. t. 62. f. 11? Amer. 110. t. 180. f. 32? *P. polyphylla*; Jacq. Obs. ibid. t. 61. f. 10.)—Leaves thrice ternate; leaflets ovate, obtuse, wavy. Footstalks winged. Clusters aggregate.—Native of South America, or the West Indies. The *clusters* are not accompanied by *tendrils*, but form a sort of *panicle*, as in *S. mexicana*. See PAULLINIA, n. 8.

There seem to be more species, of which incomplete specimens or descriptions exist, but with which we are not sufficiently acquainted to reduce them to order. Nor is the genus, in every case, to be ascertained, for want of the fruit, so essential in distinguishing *Seriana* and *Paullinia*.

SERIANE, SRICH, or *Efrich*, in *Ancient Geography*, a town of Asia, in Syria, situated in the mountains S.E. of Chalcis, about the 35th degree of latitude. It appears by its ruins to have been formerly a large town.

SERiate, in *Geography*, a town of Italy, in the department of the Serio; 3 miles E.S.E. of Bergamo.

SERICA, in *Ancient Geography*, an oriental country, the position of which was indicated very vaguely by the writers of antiquity, but which has been, it must be acknowledged, more precisely ascertained by Ptolemy. Its situation and history,

however, have been more accurately delineated by M. d'Anville, in an interesting memoir entitled "Récherches Géographiques et Historiques sur la Séricue des Anciens." M. d'Anville refutes the opinion of those who apprehended that the *Serica* described by Ptolemy corresponded to the northern part of China; and he adopts the opinion of M. de Guignes, in his History of the Huns, that it belonged to the conquests of the Chinese towards the west. M. d'Anville adds, that with the exception of a small angular territory at the extremity of the province of Chen-fi, towards the N.W., China formed no part of *Serica*. In speaking of Scythia, on the other side of the Imaus, Ptolemy mentions a passage in this mountain, which was the station of merchants that traded with the Seres. Contiguous to this station, according to Ptolemy, is a country called *Casia*, which M. d'Anville supposes to be the same with *Cashgar*, called by the Chinese Kin-tse. In proof of their identity it may be alleged that the tables of Nasir-Uddin and Ulugh-beigh assign to *Cashgar* 44° of latitude, and that Ptolemy makes the latitude of *Casia* 43°, differing only by one degree. Ptolemy mentions the river *Oechardes*, which M. d'Anville supposes to be *Yerghien*. Another river near the limits of *Serica*, mentioned by Ptolemy, is that called *Bautes*, which, in its course towards the N., is joined by the lateral branch of another river pursuing the same direction; and these circumstances correspond with those of the present *Etziné*. The *Bautes*, as M. d'Anville apprehends, loses itself in certain lagoons, at the entrance of the desert called by the Tartars *Cobi*, and by the Chinese *Sha-ono*. Duly informed concerning the *Bautes* of Ptolemy, M. d'Anville was able to settle the position of *Sera*, the metropolis of *Serica*. For according to the ancient geographers, this town is very near the point where the last branch of the *Bautes* separates from it, and a town is actually found at the eastern branch of the *Etziné*, towards its source. This town must therefore correspond to the *Sera* of Ptolemy, and bear the name of *Can-tcheou*. It is the first considerable town that occurs at the entrance of the Chinese province of Chen-fi. This town belongs to a particular country known to the Orientals under the name of *Tangut*. *Tangut* may therefore probably be the country anciently inhabited by the Seres, of which *Sera* was the capital. Another decisive proof that *Can-tcheou* is the *Sera* metropolis of Ptolemy, is deduced from the circumstance that this town, according to the Greek geographer, is 38° 35' of latitude, and that the latitude of *Can-tcheou*, according to the Jesuit astronomers, is 39°, the difference being only 25'. Ptolemy places the *Essedones* in *Serica*. But *Essedum* or *Essedo* signifying a chariot, and some of the Scythians, called by the Greeks *Hamaxobii*, or persons living in chariots, it has been inferred, that the people who bore the name of *Essedones*, in the *Serica* of Ptolemy, were merely those whose habitation was in chariots, and it is also added, that a part of the country of the Seres had borne the name of *Eygur*, and that the nation who occupied a part of this country is called by the Chinese *Kao-tché*, a word which signifies high chariots.

Serica, according to Ptolemy, is bounded to the W. by Scythia, on the other side of the Imaus; to the S. by unknown territories, and by a part of India beyond the Ganges and the Sines; the other boundaries are unknown. Its principal mountains are the *Annibi*, which encompass the Seres to the N.; the *Auxacii*, which extend to the Seres by their eastern parts; the *Asmiræi* in the country; the eastern part of the *Cassian* mountains; mount *Thagurus*, called also *Ithagurus*; the mountains *Emodi* and *Sericus*. The chief rivers are the *Oichardes* or *Oechardes*, which rises in the *Auxacian* mountains; and the *Bautes*, which springs from mount *Cassius*. The north of *Serica* was inhabited by *Anthropo-*

thropophagi; below these were the Annibi, bearing the name of these mountains; the Axacii and the Szyges, below whom were the Damnæ; the Piaddæ extended themselves to the river Oechardes. The Garinæi and the Nabbanæ lay more to the east than the Annibi. To the S. was the country called Asmiræa, where were the mountains of the same name; the Ifedones, or Esfedones, were situated to the S., and extended themselves to mount Cassius; and these formed a powerful nation; the Throani lay to the E., and below them the Ithaguri; the Aspacaræ lay to the S. of the Ifedones, and below them the Batæ; the Ottorochorræ were situated to the S. The principal towns were the Damnæ, Piada, Abmiræa or Almiræa, Tharrana or Throana, Ifedon, Sericæ, Aspacara, Drosache, Paliana, Abfagana, Thogara, Daxata, Orosana, Ottorochorra or Ottorocorras, Solana, and Sera Metropolis. It appears from the article *Little BUCHARIA*, to which we refer the reader, that no region but this can correspond to Ptolemy's Serica.

SERICH, the name of a seed used in the food of the Egyptian Copts. It is produced by an herb called *simfim*, and is pounded and put into oil. In this they dip their bread, which is always new, being baked as often as they eat, in small flat cakes; these they eat dipped in this oil with raw onions, or else they break the cakes to pieces, and put them into a syrup of sugar, made when the canes are green. Pococke's Egypt, p. 183.

SERICORA, in *Geography*, a town of Persia, in the province of Mazanderan; 15 miles N.E. of Asterabat.

SERICUM, SILK. See SILK.

SERICUM is also a name given by several chemical writers to the flowers of zinc raised by sublimation in an inclined open crucible. These flowers are not reducible into zinc again, and are of a fibrous texture, and a beautiful bright white colour. This has made them be called also the *philosophic cotton*, and others have named them the *aqua sicca philosophorum*.

SERIDIA, in *Botany*, a generic name given by Jussieu to those species of *Centaurea* which are included under the sixth section (*Stæbe*) of that genus. Juss. 173. See CENTAUREA.

SERJEANT, or SERGEANT, a term in our *Law*, applied to fundry offices. *Serjeant at law*, or *of the coif*, is the highest degree taken in the common law, as that of doctor is in the civil law.

The first mention which judge Blackstone has met with of serjeants, or *countors*, is in the stat. of West. 1. 3 Edw. I. c. 29. But M. Paris, in his life of John II. abbot of St. Alban's, which he wrote in 1255, 39 Hen. III. speaks of advocates at the common law, or countors (*quos banci narratores vulgariter appellamus*) as of an order of men well known; and the antiquity of the coif appears from the same author's Hist. of England, A.D. 1259. Serjeants were anciently called *servientes ad legem*, and *servientes narratores*; Mr. Selden adds, that they were also called *doctores legis*; though others are of opinion that the judges are more properly the *doctores legis*, and serjeants, the *bachelors of law*.

Spelman observes, that however a serjeant may be richer than all the doctors of the Commons, yet a doctor is superior in degree to a serjeant, for the very name of a doctor is magisterial, but that of a serjeant ministerial. Hence, the doctors are seated and covered when they plead, but the serjeants stand uncovered at the bar, excepting for their coif.

As these are supposed the most learned and experienced, there is one court appropriated for them to plead in by themselves, which is the Common Pleas, where the common law of England is most strictly observed; but they are not prohibited pleading in other courts; and all judges, who, by custom, must first be serjeants, call them *brothers*.

Serjeants at law are bound by a solemn oath to do their

duty to their clients; and by custom the judges of the courts of Westminster are always admitted into this venerable order, before they are advanced to the bench; the original of which was probably to qualify the puisné barons of the exchequer to become justices of assize, according to the exigence of the statute of 14 Edw. III. c. 16.

They are called by the king's mandate, or writ, directed to them, commanding them to take upon them that degree, by a day assigned. See BARRISTER.

Out of these, some are made the king's serjeants to plead for him in all causes, especially in cases of treason; and one is usually appointed, called *premier serjeant*. See COUNSEL and PRECEDENCE.

SERJEANTS *at Arms*, are officers appointed to attend the person of the king, to arrest traitors, and persons of quality offending, and to attend the lord high steward when he sits in judgment on any traitor, &c.

These officers were first instituted by king Richard I. in imitation of a corps of the same name, formed by Philip Augustus, king of France, when on a crusade, to guard him against the subjects of the old man of the mountain, famous for their daring assassinations. Of these by statute (13 Ric. II. c. 6.) there are not to be above 30 in the realm.

The duty of these serjeants originally was to watch round the king's tent in complete armour, with a mace, a bow, arrows, and a sword, and occasionally to arrest traitors, and other offenders, about the court, for which the mace was deemed a sufficient authority. They were called the valourous force of the king's errand, in the execution of justice; they held their places for life; their number was originally twenty-four, all persons of approved worth, and not under the degree of the son of a knight; but afterwards the sons of gentlemen were admitted into the body. In the reign of Edward I. the serjeants at arms were allowed two marks for winter, and the same for summer robes; their pay in that of Edward II. was 12*d.* per diem, when they attended on horseback, and 8*d.* when they attended without a horse. Their allowance, when absent from court, on the king's affairs, was 12*d.* each by the day; and under another head they appear charged at 26*s.* 8*d.* each for winter, and 20*s.* for summer. They were besides entitled to certain fees from persons arrested, in proportion to their rank and degree. According to the orders given by Thomas of Lancaster, constable at the siege of Caen, Sept. 3d. 1417, a serjeant at arms was to appear in the king's presence, with his head bare, his body armed to the feet with the arms of a knight riding, wearing a gold chain with a medal, bearing all the king's coats, with a peon royal, or mace of silver, in his right hand, and in his left hand a truncheon. In the 7th of Hen. VII. they were ordered to attend the army. The number of this corps has varied exceedingly. In the reign of Edw. IV. they were reduced to four; in that of Edw. VI. they were increased to twenty-two, and in the succeeding reign to twenty-three; but by king James I. retrenched to fifteen, and afterwards to eight.

Such is the number now at court, at 100*l.* per annum salary each; they are called the *king's serjeants at arms*, to distinguish them from others; they are created with great ceremony, the person kneeling before the king, his majesty lays the mace on his right shoulder, and says, *Rise up serjeant at arms, and esquire for ever*. They have, besides, a patent for the office, which they hold for life.

They have their attendance in the presence-chamber, where the band of gentlemen-pensioners wait; and receiving the king at the door, they carry the maces before him to the chapel door, whilst the band of pensioners stand foremost, and make a lane for the king, as they also do when the king goes to the house of lords.

They

They have a considerable share of the fees of honour, and travelling charges allowed them when in waiting, viz. five shillings per day when the court is within ten miles of London, and ten shillings when twenty miles from London. The places are in the lord chamberlain's gift.

There are four other serjeants at arms, created in the same manner; one who attends the lord chancellor; a second, the lord treasurer; a third, the speaker of the house of commons; and a fourth, the lord mayor of London on solemn occasions.

There are also serjeants of the mace of an inferior kind, who attend the mayor, or other head officer of a corporation.

SERJEANT, Common, an officer in the city of London, who attends the lord mayor and court of aldermen on court days, and is in council with them on all occasions, within and without the precincts, or liberties of the city. He was to take care of orphans' estates, either by taking account of them, or by signing their indentures, before their passing the lord mayor and court of aldermen; and he was likewise to let and manage the orphans' estates, according to his judgment to their best advantage. See **RECORDER**.

SERJEANTS of the Household, are officers who execute several functions within the king's household, mentioned in the stat. 33 Hen. VIII. c. 12.

SERJEANT, or Sergeant, in War, is a non-commissioned or inferior officer in a company of foot, or troop of dragoons; armed with an halberd, and appointed to see discipline observed, to teach the soldiers their exercise and other duty. He receives the orders from the adjutant, which he communicates to his officers.

Each company has generally two serjeants.

SERJEANT, Covering, a non-commissioned officer, who, during the exercise of a battalion, regularly stands or moves behind each officer, commanding or acting with a platoon or company. When the ranks take open order, and the officers move in front, the covering serjeants replace their leaders; and when the ranks are closed they fall back in their rear.

SERJEANT, Drill, an expert and active non-commissioned officer, who, under the immediate direction of the serjeant-major, instructs the raw recruits of a regiment in the first principles of military exercise. When awkward or ill-behaved men are sent to drill, they are usually placed under the care of the drill-serjeant.

SERJEANT, Lance, a corporal who acts as serjeant in a company, but only receives the pay of corporal.

SERJEANT-Major. See **MAJOR**.

SERJEANT, Pay, an honest, steady, non-commissioned officer, who is a good accountant, and writes well, that is selected by the captain of a company in the infantry to pay the men twice a-week, and to account weekly to him, or to his subaltern, for all disbursements. He likewise keeps a regular statement of the necessaries of the men, and assists in making up the monthly abstract for pay, allowances, &c.

SERJEANT, Quarter-Master, a non-commissioned officer, who acts under the quarter-master of a regiment: he ought to be steady, a good accountant, and well acquainted with the resources of a country town or village.

SERJEANTY, or SERGEANTY, in Law, a service anciently due to the king for lands held of him, and which could not be due to any other lord.

It is divided into *grand* and *petit* serjeanty.

SERJEANTY, Grand, is where one holds lands of the king by service which he ought to do in his own person, as to bear the king's banner or spear, assist at his coronation, or do some office in his court.

It was in most other respects like knight-service, only he was not bound to pay aid or escuage; and when tenant by knight-service paid five pounds for a relief on every knight's fee, tenant by grand-serjeanty paid one year's value of his land, whether it were much or little. Tenure by cornage was a species of grand-serjeanty. See **CORNAGE**. Litt. § 153. 158. 2 Inst. 233.

SERJEANTY, Petit, is where a man holds land of the king to yield him yearly some small thing towards his wars, as a sword, dagger, bow, spurs, &c. in the manner of rent.

Coke, on Littleton, tells us, that sir Richard Rockefly held lands at Seaton, by grand-serjeanty, to be *vantrarius regis, i. e.* the king's fore-footman, when he went into Gasconne, till he had worn out a pair of shoes of the price of four-pence.

By the statute 12 Car. II. all tenures of any honors, manors, lands, &c. are turned into free and common socage: but the honorary services of grand-serjeanty are thereby continued.

SERIES, a continual succession of things in the same order, and which have some relation or connection with each other.

Medals are formed into *suites* or *serieses*, both with regard to the metal and to the subject. The different metals of medals constitute three different serieses in the cabinets of the curious, we mean, as to the order and arrangement of the several metals.

The gold series, for instance, of imperials, amounts to about 5000; that of silver may amount to 10,000; and that of brass to 30,000. See **MEDALS**.

With regard to the subject, the series of medals are usually formed from the side called the *head*: in the first class, is disposed the serieses of kings; in the second, that of Greek and Latin critics; in the third, the Roman consular families; in the fourth, the imperial; in the fifth, the deities; and to these may be added a sixth series, consisting of medals of illustrious persons. See **MEDALS**.

There are also serieses of modern medals: that of the popes only commences from Martin V. in 1430. From that time we have a series of papal medals, tolerably complete, to the number of five or six hundred.

We might likewise have a series of emperors from Charlemagne, provided the current coins were admitted; but in practice they commonly commence with Frederic II. in 1463.

The series of the kings of France is most numerous and most considerable of all the modern kings. See **MEDALS**.

SERIES, in Analysis, is a succession of terms, or progression of quantities, connected together by the signs plus and minus, and proceeding according to some law or determinate relation. Such are the following.

$$1 + \frac{1}{3} + \frac{1}{5} + \frac{1}{7} + \frac{1}{9} + \&c.$$

$$1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \frac{1}{16} + \&c.$$

The former being the reciprocals of the odd numbers, and the terms of the latter a geometrical progression, of which the ratio is $\frac{1}{2}$.

Series are of various forms, and arise in many different ways, as from the expansion of functions, the inverse method of fluxions, &c. But they very frequently arise independent of any general derivation, and the object of enquiry is then to determine that function to which they are equivalent, and from the expansion of which they may be reproduced, or the numeral value of a certain or of an infinite number of their terms.

Thus,

SERIES.

Thus, of the former kind, we have

$$\frac{1}{a+b} = (a+b)^{-1} = \frac{1}{a} - \frac{b}{a^2} + \frac{b^2}{a^3} - \frac{b^3}{a^4} + \&c.$$

$$\frac{1}{a-b} = (a-b)^{-1} = \frac{1}{a} + \frac{b}{a^2} + \frac{b^2}{a^3} + \frac{b^3}{a^4} + \&c.$$

and a variety of others. And of the latter,

$$\frac{1}{a^n} + \frac{2}{a^{2n}} + \frac{3}{a^{3n}} + \frac{4}{a^{4n}} + \frac{5}{a^{5n}} + \&c.$$

$$\frac{1}{2^n} + \frac{1}{3^n} + \frac{1}{4^n} + \frac{1}{5^n} + \frac{1}{6^n} + \&c.$$

&c. &c. &c.

Many of which are still irreducible to any equivalent finite function.

Series also receive several different denominations according to certain circumstances attending their formation, the law which they follow, the form of the function to which they are reducible, &c. &c. as arithmetical, geometrical, converging, diverging, reciprocal, &c. series.

SERIES, *Converging*, are those in which the terms decrease, or become successively less and less; as

$$1 + \frac{1}{5} + \frac{1}{5^2} + \frac{1}{5^3} + \frac{1}{5^4} + \&c.$$

SERIES, *Diverging*, are those in which the terms continually increase; as

$$1 - 2 + 2^2 - 2^3 + 2^4 - 2^5 + \&c.$$

SERIES, *Neutral*, are those in which all the terms are equal to each other; as

$$1 - 1 + 1 - 1 + 1 - 1 + \&c.$$

This arises from the division of 1 by 1 + 1, and is therefore equal to $\frac{1}{2}$.

SERIES, *Indeterminate*, is sometimes used to denote a series, whose terms proceed according to the powers of some indeterminate letter or quantity; as

$$x + \frac{1}{2}x^2 + \frac{1}{3}x^3 + \frac{1}{4}x^4 + \frac{1}{5}x^5 + \&c.$$

Other writers, however, mean by this denomination those series whose sums are indeterminable in any finite form.

Series are again either ascending or descending.

SERIES, *Ascending*, are those in which the powers of the indeterminate quantity continually increase; as

$$1 + ax + bx^2 + cx^3 + dx^4 + \&c.$$

SERIES, *Descending*, are those in which these powers decrease in the numerator, or increase in the denominator; as

$$1 + ax^{-1} + bx^{-2} + cx^{-3} + dx^{-4} + \&c. \text{ or}$$

$$1 + \frac{a}{x} + \frac{b}{x^2} + \frac{c}{x^3} + \frac{d}{x^4} + \&c.$$

SERIES, *Circular*, are those whose sums depend upon the quadrature of the circle: thus,

$$1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \&c. \text{ and}$$

$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} - \&c.$$

are circular series; the former being equal to one-eighth of the circumference of a circle whose radius is 1; and the latter equal to one-sixth of the square of the semi-circumference to the same radius.

SERIES, *Logarithmic*, are those which express, or whose sums depend upon the logarithms of numbers; as

$$(a-1) - \frac{1}{2}(a-1)^2 + \frac{1}{3}(a-1)^3 - \frac{1}{4}(a-1)^4 + \&c.$$

which is equal to the hyperbolic logarithm of a .

SERIES, *Arithmetical*, are those whose successive terms differ from each other by a certain and determinate quantity; as

$$a + (a+d) + (a+2d) + (a+3d) + \&c.$$

$$a + (a-d) + (a-2d) + (a-3d) + \&c.$$

SERIES, *Geometrical*, are those whose successive terms are some multiple or submultiple of those immediately preceding them; as

$$a + ra + r^2a + r^3a + r^4a + \&c.$$

$$a + \frac{a}{r} + \frac{a}{r^2} + \frac{a}{r^3} + \frac{a}{r^4} + \&c.$$

SERIES, *Fractional*, are those whose terms are all fractional; as

$$\frac{a}{b(b+c)} + \frac{a}{(b+c)(b+2c)} + \frac{a}{(b+2c)(b+3c)} + \&c.$$

SERIES, *Trigonometrical*, are those which relate to trigonometrical lines or quantities; as

$$\sin. a + \frac{\sin.^3 a}{2 \cdot 3 r^2} + \frac{3 \sin.^5 a}{2 \cdot 4 \cdot 5 r^4} + \frac{3 \cdot 5 \sin.^7 a}{2 \cdot 4 \cdot 6 \cdot 7 r^6} + \&c.$$

$$\tan. a - \frac{\tan.^3 a}{3 r^2} + \frac{\tan.^5 a}{5 r^4} - \frac{\tan.^7 a}{7 r^6} + \&c.$$

which are each expressions for the length of a circular arc, the former in terms of the sine, and the latter in terms of the tangent.

SERIES, *Exponential*, are those which arise from the expansion of, or whose sum depends upon exponential quantities; as

$$1 + \frac{x}{1} + \frac{x^2}{2} + \frac{x^3}{2 \cdot 3} + \frac{x^4}{2 \cdot 3 \cdot 4} + \&c.$$

which is equal to e^x , e being the number whose hyperbolic logarithm is 1.

SERIES, *Recurring*, are those in which each term has a constant relation to a certain number of the preceding terms. See *RECURRING SERIES*.

SERIES, *Law of a*, is used to denote that relation which subsists between the successive terms of a series, and by which their general term may be denoted: thus the series

$$1 + \frac{2}{3}x + \frac{8}{15}x^2 + \frac{16}{35}x^3 + \frac{128}{315}x^4 + \&c.$$

may be put under the form

$$1 + \frac{2}{3}x + \frac{2 \cdot 4}{3 \cdot 5}x^2 + \frac{2 \cdot 4 \cdot 6}{3 \cdot 5 \cdot 7}x^3 + \frac{2 \cdot 4 \cdot 6 \cdot 8}{3 \cdot 5 \cdot 7 \cdot 9}x^4 + \&c.$$

where the law by which it may be indefinitely continued is manifest; and from which we draw the general term, viz.

$$\frac{2 \cdot 4 \cdot 6 \dots 2(n-1)}{3 \cdot 5 \cdot 7 \dots (2n-1)} x^{n-1}.$$

SERIES, *Interpolation of*. See *INTERPOLATION*.

SERIES, *Reversion of*. See *REVERSION*.

SERIES, *Summation of*, is the finding the sum of a series, whether the number of its terms be finite or infinite; the various methods of performing which is treated of in the subsequent part of this article.

Method

SERIES.

Method of series is used in a general sense to denote the principle upon which different authors have treated this subject, as well with reference to the reversion and interpolation of series, as to the finite and approximate summation of them.

The doctrine of series is certainly one of the most important subjects of mathematical investigation, and has been very appropriately denominated by James Bernoulli the *sheet-anchor* of analysis; being our only hope and last resort, in a variety of difficult problems, which bid defiance to every other method of computation.

The summation of series, and the quadrature of a curvilinear space, are intimately connected with each other, as well in their origin as in their subsequent progress. We have stated under the article QUADRATURE, that Archimedes was the first who found the area of a curvilinear space, which he effected by means of the summation of an infinite series upon geometrical principles, and which is the first instance on record of such an operation; from which time, for nearly two thousand years, little or nothing was attempted relative to this subject; but about the middle and the latter end of the 17th century, it began to attract the general attention of mathematicians, and has since that time been pursued with a degree of perseverance and success commensurate with its great importance, and the general progress of analysis during the same period.

Wallis, in his *Arithmetic of Infinites*, seems to have been the first amongst the moderns who drew the attention of mathematicians to the doctrine of series. Lord Brouncker, sir Christopher Wren, Mercator, and James Gregory, also pursued the subject with considerable success, exhibiting the quadrature and rectification of different curves under the form of infinite series.

In 1682, Leibnitz published in the *Leipsc Acta*, a memoir entitled "De proportionibus circuli ad quadratum circumscriptum, in numeris rationalibus," in which he gave several numerical series of a very novel kind, whose sums were expressible in finite terms, without, however, accompanying them with their demonstrations; amongst the most curious of which we may reckon the following: *viz.*

$$\frac{1}{3} + \frac{1}{8} + \frac{1}{15} + \frac{1}{24} + \frac{1}{35} + \frac{1}{48} + \&c. \text{ or } \frac{1}{2^2 - 1} + \frac{1}{3^2 - 1} + \frac{1}{4^2 - 1} + \frac{1}{5^2 - 1} + \&c.$$

The sum of an infinite number of terms of which is equal to $\frac{3}{4}$; the sum of its odd terms being equal to $\frac{1}{2}$, and the sum of its even terms equal to $\frac{1}{4}$: that is

$$\frac{1}{1 \cdot 3} + \frac{1}{3 \cdot 5} + \frac{1}{5 \cdot 7} + \frac{1}{7 \cdot 9} + \frac{1}{9 \cdot 11} + \&c. = \frac{1}{2}, \text{ and } \frac{1}{2 \cdot 4} + \frac{1}{4 \cdot 6} + \frac{1}{6 \cdot 8} + \frac{1}{8 \cdot 10} + \frac{1}{10 \cdot 12} + \&c. = \frac{1}{4}.$$

The sum of an infinite number of terms of the same series, omitting every three terms after the 1st, the 5th, the 9th, &c. as

$$\frac{1}{1 \cdot 3} + \frac{1}{5 \cdot 7} + \frac{1}{9 \cdot 11} + \frac{1}{13 \cdot 15} + \frac{1}{17 \cdot 19},$$

is equal to the area of a circle of which the inscribed square is $\frac{1}{4}$.

But if we begin at the second term, and thence omit every three terms, as above, we shall have

$$\frac{1}{2 \cdot 4} + \frac{1}{6 \cdot 8} + \frac{1}{10 \cdot 12} + \frac{1}{14 \cdot 16} + \&c.$$

VOL. XXXII.

which is equal to the area or space included between the curve and asymptote of an equilateral hyperbola, or $\frac{1}{4}$ of the hyp. log. 2.

Leibnitz also gave in the same work for 1683, the summation of several other series of a more difficult kind, as

$$1 - \frac{1}{2 \cdot 10} + \frac{1}{2 \cdot 10^2} - \frac{1}{2 \cdot 10^3} + \frac{1}{2 \cdot 10^4} - \&c. = \frac{20}{21}$$

$$1 - \frac{2}{2 \cdot 10} + \frac{3}{2 \cdot 10^2} - \frac{4}{2 \cdot 10^3} + \frac{5}{2 \cdot 10^4} - \&c. = \left(\frac{20}{21}\right)^2$$

$$1 - \frac{3}{2 \cdot 10} + \frac{6}{2 \cdot 10^2} - \frac{10}{2 \cdot 10^3} + \frac{15}{2 \cdot 10^4} - \&c. = \left(\frac{20}{21}\right)^3$$

These, as we have before observed, were not demonstrated by Leibnitz, but this was soon after done, and many other series investigated, by the brothers John and James Bernoulli; the latter in a small tract "De Seriebus Infinitis," published with the "Ars Conjectandi;" and the former in vol. iv. of his "Opera Omnia."

From the preface to the former tract we learn, that James, having turned his attention to the doctrine of series, had discovered a few which were summable, and which he proposed to his brother; who having quickly demonstrated them, proposed others to James; this led to other propositions, and so on, till in a short time they were not only able to demonstrate all Leibnitz's series, but had discovered two general principles, which applied with great facility to a variety of new cases; the one of which was the resolution of an infinite series into an infinite number of other series; and the other, the method commonly called the *summation by subtraction*. We see here that spirit of emulation and rivalry with which these two brothers were constantly actuated, and to which they each probably owe many of their finest discoveries. It is only to be regretted that it terminated in a manner so unworthy of their talents and character; particularly with regard to John, who was doubtless at first much indebted to his brother's instruction, but who, notwithstanding, indulged his resentment against him for many years after his death, seeking every opportunity of aspersing his methods, and of lessening his reputation.

The Bernoullis' Method of Series.—The principal difference between the methods of these two celebrated mathematicians consists in this, that James, in his "Tractatus de Seriebus Infinitis," proceeds synthetically; and John, in his "Opera Omnia," analytically; but the series in both cases are nearly of the same kinds, and the summation of them depends upon the same principles; we shall, therefore, by way of illustration, abstract one or two propositions from the former work, which will be sufficient for giving the reader an idea of the spirit of the two methods above alluded to.

Prop.—To find the sum of an infinite number of fractions, whose denominators increase in any geometrical progression, but whose numerators proceed according to the natural numbers, or polygonal or figurate numbers, of any denomination.

Case 1.—When the numerators proceed according to the natural numbers, that is, when they form an arithmetical progression.

Let the proposed series, whose sum is required, be

$$\frac{a}{b} + \frac{a+c}{b \cdot d} + \frac{a+2c}{b \cdot d^2} + \frac{a+3c}{b \cdot d^3} + \&c.$$

N n

This

SERIES.

This is obviously equal to

$$\begin{aligned} \frac{a}{b} + \frac{a}{b d} + \frac{a}{b d^2} + \frac{a}{b d^3} + \&c. &= \frac{a d}{b d - b} \\ + \frac{c}{b d} + \frac{c}{b d^2} + \frac{c}{b d^3} + \&c. &= \frac{c d}{b d - b} \\ + \frac{e}{b d^2} + \frac{e}{b d^3} + \&c. &= \frac{c d}{b d^2 - b d} \\ + \frac{c}{b d^3} + \&c. &= \frac{c d}{b d^3 - b d^2} \\ + \&c. &= \&c. \end{aligned}$$

Each of which series being geometrical, are found by the known rules for such progressions; and it is obvious that all these sums, except the first, are also in geometrical progression; the sum of which, viz. of

$$\begin{aligned} \frac{c d}{b d - b} + \frac{c d}{b d^2 - b d} + \frac{c d}{b d^3 - b d^2} + \frac{c d}{b d^4 - b d^3} \\ + \&c. &= \frac{c d}{b (d - 1)^2} \end{aligned}$$

to which therefore adding $\frac{a d}{b (d - 1)}$, we have $\frac{a d}{b (d - 1)}$ + $\frac{c d}{b (d - 1)^2}$ for the sum of the proposed series.

Case 2.—When the numerators of the fractions proceed according to the triangular numbers. Let

$$\frac{c}{b} + \frac{3c}{b d} + \frac{6c}{b d^2} + \frac{10c}{b d^3} + \&c.$$

be the proposed series. This may be resolved as follows: viz.

$$\begin{aligned} \frac{c}{b} + \frac{c}{b d} + \frac{c}{b d^2} + \frac{c}{b d^3} + \&c. &= \frac{c d}{b d - b} \\ + \frac{2c}{b d} + \frac{2c}{b d^2} + \frac{2c}{b d^3} + \&c. &= \frac{2c}{b d - b} \\ + \frac{3c}{b d^2} + \frac{3c}{b d^3} + \&c. &= \frac{3c}{b d^2 - b d} \\ + \frac{4c}{b d^3} + \&c. &= \frac{4c}{b d^3 - b d^2} \\ + \&c. &= \&c. \end{aligned}$$

which sums, with the exception of the first, constitute a series agreeing in form with that solved above, and from which we derive $\frac{c d^3}{b (d - 1)^3}$ for the sum required.

Cor.—If we make a in the first series = 0, the sum of that series will be to the sum of the latter, as $d - 1 : d^3$; that is,

as $d - 1 : d^2 :: \frac{c d}{b (d - 1)^2} : \frac{c d^3}{b (d - 1)^3}$. And when the

numerators proceed according to the figurate numbers of the first order, viz. 1, 4, 20, 35, then the sum of this series will be to that of the latter, as $d : d - 1$; that is,

as $d - 1 : d :: \frac{c d^3}{b (d - 1)^3} : \frac{c d^3}{b (d - 1)^4}$ = the sum of the

series $\frac{c}{b} + \frac{4c}{b d} + \frac{10c}{b d^2} + \frac{20c}{b d^3} + \frac{35c}{b d^4} + \&c.$

In a similar manner is found the sum of the series, when the numerators are squares, cubes, &c. from which the author draws the following results; viz.

$$\text{Nat. Num.} \quad \frac{1}{2} + \frac{2}{2^2} + \frac{3}{2^3} + \frac{4}{2^4} + \&c. = 2$$

$$\text{Trian. Num.} \quad \frac{1}{2} + \frac{3}{2^2} + \frac{6}{2^3} + \frac{10}{2^4} + \&c. = 4$$

$$\text{Fig. 1st order} \quad \frac{1}{2} + \frac{4}{2^2} + \frac{10}{2^3} + \frac{20}{2^4} + \&c. = 8$$

$$\text{Squares} \quad \frac{1}{2} + \frac{4}{2^2} + \frac{9}{2^3} + \frac{16}{2^4} + \&c. = 6$$

$$\text{Cubes} \quad \frac{1}{2} + \frac{8}{2^2} + \frac{27}{2^3} + \frac{64}{2^4} + \&c. = 26$$

As an illustration of the second method, that is, of summation by subtraction, we shall give an abstract of James Bernoulli's fifteenth proposition, which is as follows.

Prop.—To find the sum of an infinite series of fractions, whose numerators constitute a series of equal numbers, and denominators, a series of triangular numbers, or of their multiples.

$$\text{From the series} \quad \frac{a}{c} + \frac{a}{2c} + \frac{a}{3c} + \frac{a}{4c} + \frac{a}{5c} = S$$

$$\text{subtract} \quad \frac{a}{2c} + \frac{a}{3c} + \frac{a}{4c} + \frac{a}{5c} + \frac{a}{6c} = S - \frac{a}{c}$$

$$\text{we have} \quad \frac{a}{2c} + \frac{a}{6c} + \frac{a}{12c} + \frac{a}{20c} + \frac{a}{30c} = \frac{a}{c}$$

$$\text{the double of which} = \frac{a}{c} + \frac{a}{3c} + \frac{a}{6c} + \frac{a}{10c} + \frac{a}{15c} = \frac{2a}{c}$$

which last is a series of fractions of the form proposed, their denominators forming the series of triangular numbers, multiplied by the constant quantity c . Thus in numbers; if from the series

$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \&c. = S$$

(without regarding what may be the value of S), we take

$$\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \&c. = S - 1$$

we shall have

$$\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \frac{1}{4 \cdot 5} + \&c. = 1.$$

In the same way we find

$$\frac{1}{1 \cdot 3} + \frac{1}{2 \cdot 4} + \frac{1}{3 \cdot 5} + \frac{1}{4 \cdot 6} + \&c. = \frac{3}{4}$$

On the same principle, John Bernoulli demonstrated, that the sum of the reciprocals of the natural numbers is infinite. Let

$$\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \&c.$$

be changed into the equivalent form

$$\frac{1}{2} + \frac{2}{6} + \frac{3}{12} + \frac{4}{20} + \frac{5}{30} + \&c.$$

and

and let this last be resolved into the infinite series

$$\begin{aligned} \frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \&c. &= 1 \\ + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \&c. &= \frac{1}{2} \\ + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \&c. &= \frac{1}{3} \\ + \frac{1}{20} + \frac{1}{30} + \&c. &= \frac{1}{4} \\ + \frac{1}{30} + \&c. &= \frac{1}{5} \\ + \&c. &= \&c. \end{aligned}$$

Whence it follows, that the sum of

$$\begin{aligned} \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \&c. \text{ ad infinitum} = \\ 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \&c. \text{ ad infinitum} \end{aligned}$$

which equality can only have place when the first sum is infinite.

John Bernoulli afterwards found the sum of the series of the reciprocals of the natural squares, a problem mentioned by his brother, in his scholium to proposition 17, in which he declared that the solution of it had evaded his industry; and that whoever solved it should receive his warmest thanks.

It should be observed, however, that though James had failed in finding the true sum, he had discovered several curious properties of this series; viz. that the sum of the odd

terms, $1 + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2}$, is to the sum of the even terms,

$\frac{1}{2^2} + \frac{1}{4^2} + \frac{1}{8^2}$, as 3 to 1. And generally, if we have a

series of the reciprocals of any powers whatever, as $\frac{1}{1^n} +$

$\frac{1}{2^n} + \frac{1}{3^n} + \frac{1}{4^n} + \&c.$ the sum of the terms in the odd places beginning at unity, is to the sum of the terms in the even places, as $n - 1$ is to 1. Hence,

$$1 + \frac{1}{3^3} + \frac{1}{5^3} + \frac{1}{7^3} + \&c. : \frac{1}{2^3} + \frac{1}{4^3} + \frac{1}{6^3} + \&c. :: 7 : 1.$$

John Bernoulli's solution of the above problem depends upon the expression for the sine of an arc in terms of the arc, the same as that of Landen, of which we shall speak in the subsequent part of this article, and shall, therefore, only give here the results that Bernoulli drew from his solution; viz. he proved that

$$\begin{aligned} 1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \&c. &= \frac{\pi^2}{6} \\ 1 + \frac{1}{2^4} + \frac{1}{3^4} + \frac{1}{4^4} + \frac{1}{5^4} + \&c. &= \frac{\pi^4}{90} \\ 1 + \frac{1}{2^6} + \frac{1}{3^6} + \frac{1}{4^6} + \frac{1}{5^6} + \&c. &= \frac{\pi^6}{945} \\ \&c. \quad \&c. \quad \&c. \end{aligned}$$

where π denotes the semi-circumference of a circle whose radius is 1. Montucla has, by mistake, attributed the first

summation of this series to Euler, see page 209, tom. iii. "Histoire des Mathematiques."

We shall only further observe with regard to these authors, that we here find the first notice of continued expressions of the form

$$\begin{aligned} \sqrt{a + \sqrt{a + \sqrt{a + \sqrt{a + \&c.}}}} \\ \sqrt{a + b \sqrt{a + b \sqrt{a + b \sqrt{a + \&c.}}}} \end{aligned}$$

with the method of summing them by means of quadratic, cubic, and biquadratic equations. See our articles QUADRATIC, and SURDS.

3. *Montmort's Method of Series.*—The two methods above illustrated, by means of which the Bernoullis arrived at the summation of various series, are both indirect, and are better suited to finding summable series, than to the summation of any series proposed; they are moreover only applicable to such series as continually decrease *ad infinitum*.

In 1712 another interesting correspondence took place on series of a different kind, between M. Montmort, John Bernoulli, and his nephew Nicholas Bernoulli. They were led to these considerations, in consequence of certain problems relating to the doctrine of probabilities, which at that time began to excite great interest amongst both the English and French mathematicians. The object here was not the determination of the sum of an infinite number of decreasing terms, but the summation of any finite number of terms, either increasing or decreasing; and the formula of M. Montmort, given at page 65 of his "Essai d'Analyse sur les Jeux de Hazard," second edition, for this purpose, is as follows.

Let $a + b + c + d + e + f + \&c.$ be the proposed series, and n the number of terms whose sum is required; also, let $D', D'', D''', D''', \&c.$ be the first terms of the first, second, third, fourth, $\&c.$ differences; then will the sum of the n terms be expressed by

$$\begin{aligned} na + \frac{n(n-1)}{1 \cdot 2} D' + \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3} D'' \\ + \frac{n \cdot \cdot \cdot (n-3)}{1 \cdot 2 \cdot 3 \cdot 4} + \&c. \end{aligned}$$

which series will terminate in all cases where any of the order of differences become zero; but in others it will only give an approximation.

Let it be required, for example, to find the sum of n terms of the natural series of the squares

$$1^2 + 2^2 + 3^2 + 4^2 + 5^2 \cdot \cdot \cdot n^2$$

Here $a = 1$, $D' = 3$, $D'' = 2$, $D''' = 0$; therefore

$$n + \frac{n(n-1)}{1 \cdot 2} 3 + \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3} 2$$

is the sum required.

If it were the series of triangular numbers,

$$1 + 3 + 6 + 10 + \cdot \cdot \cdot n \frac{(n+1)}{2}$$

then we should have

$$a = 1, D' = 2, D'' = 1, D''' = 0;$$

therefore the sum of n terms will be expressed by

$$n + \frac{n(n-1)}{1 \cdot 2} 2 + \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3}$$

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SERIES.

From this general formula are readily drawn the following particular expressions for the sums of the different orders of polygonal and figurate numbers; as also for the squares, cubes, and higher powers.

Figurate Numbers.

Series.	General term.	Sum of n terms.
$1 + 2 + 3 + 4 + \dots$	n	$= \frac{n(n+1)}{1 \cdot 2}$
$1 + 3 + 6 + 10 + \dots$	$\frac{n(n+1)}{1 \cdot 2}$	$= \frac{n(n+1)(n+2)}{1 \cdot 2 \cdot 3}$
$1 + 4 + 10 + 20 + \dots$	$\frac{n(n+1)(n+2)}{1 \cdot 2 \cdot 3}$	$= \frac{n(n+1)(n+2)(n+3)}{1 \cdot 2 \cdot 3 \cdot 4}$
$1 + 5 + 15 + 35 + \dots$	&c.	= &c.

where the law of continuation is sufficiently obvious.

Polygonal Numbers.

Series.	General term.	Sum of n terms.
$1 + 2 + 3 + 4 + \dots$	n	$= n + \frac{n(n-1)}{1 \cdot 2}$
$1 + 3 + 6 + 10 + \dots$	$\frac{n^2 + n}{1 \cdot 2}$	$= n + \frac{2n(n-1)}{1 \cdot 2} + \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3}$
$1 + 4 + 9 + 16 + \dots$	$\frac{2n^2 - n}{1 \cdot 2}$	$= n + \frac{3n(n-1)}{1 \cdot 2} + \frac{2n(n-1)(n-2)}{1 \cdot 2 \cdot 3}$
$1 + 5 + 12 + 22 + \dots$	$\frac{3n^2 - n}{1 \cdot 2}$	$= n + \frac{4n(n-1)}{1 \cdot 2} + \frac{3n(n-1)(n-2)}{1 \cdot 2 \cdot 3}$

universally; the general term being

$$\frac{(m-2)n^2 - (m-4)n}{1 \cdot 2}$$

$$\text{The sum of } n \text{ terms} = n + \frac{(m-1)n(n-1)}{1 \cdot 2} + \frac{(m-2)n(n-1)(n-2)}{1 \cdot 2 \cdot 3}.$$

Powers.

Series.	General term.	Sum.
$1^2 + 2^2 + 3^2 + 4^2 + \dots$	n^2	$= \frac{n^3}{3} + \frac{n^2}{2} + \frac{n}{6}$
$1^3 + 2^3 + 3^3 + 4^3 + \dots$	n^3	$= \frac{n^4}{4} + \frac{n^3}{2} + \frac{n^2}{4}$
$1^4 + 2^4 + 3^4 + 4^4 + \dots$	n^4	$= \frac{n^5}{5} + \frac{n^4}{2} + \frac{n^3}{3} + \frac{n}{30}$
$1^5 + 2^5 + 3^5 + 4^5 + \dots$	n^5	$= \frac{n^6}{6} + \frac{n^5}{2} + \frac{5n^4}{12} - \frac{n^2}{12}$
&c.	&c.	= &c.

A variety of other series fall under the above general formula of M. Montmort; viz. series of which the sum may be exhibited in a finite form: and in all cases where the successive differences decrease, an approximation may be obtained by it, and that with a considerable degree of facility, when the terms are alternately + and - 1, but when they are all plus, or all minus, except the first, little, if any, advantage is gained by it.

The above method of summation is commonly called the *differential method*, and was first used for *interpolation* by Briggs, in the construction of his table of logarithms. Newton also applied it to a variety of interesting problems in his "Methodus Differentialis;" but Montmort, as far as we have been able to trace, was the first who employed it in the summation of series.

The following formulæ, all relating to the differential method, will not be unacceptable to the reader.

Let $a + b + c + d + e + f + \dots$ be any series; make

$$D' = b - a$$

$$D'' = a - 2b + c$$

$$D''' = a - 3b + 3c - d$$

$$D^{iv} = a - 4b + 6c - 4d + e$$

$$\dots \dots \dots$$

$$D^{(n)} = a - nb + \frac{n(n-1)}{1 \cdot 2}c - \frac{(n-1)(n-2)}{1 \cdot 2 \cdot 3}d + \dots$$

From which last general formula the first term of any order of differences may be found independent of all those which precede it.

Again,

SERIES.

Again, let N represent the n th term, and S the sum of n terms; then will

$$N = a + \frac{(n-1)}{1} D' + \frac{(n-1)(n-2)}{1 \cdot 2} D'' + \frac{(n-1)(n-2)(n-3)}{1 \cdot 2 \cdot 3} D''' + \&c.$$

$$S = na + \frac{n(n-1)}{1 \cdot 2} D' + \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3} D'' + \frac{n(n-1)(n-2)(n-3)}{1 \cdot 2 \cdot 3 \cdot 4} D''' + \&c.$$

which latter expression for the sum is, as we have above observed, due to M. Montmort. The same author also published in the Philosophical Transactions for 1718, some other formulæ for the summation of series; but as these are nothing more than particular cases of the method of increments, we shall not notice them in this place; but refer the reader to the article INCREMENTS, for an illustration of the method of summation as depending upon those principles, first published by Dr. Brooke Taylor, in his "Methodus Incrementorum," 1715.

4. *De Moivre's Method of Series.* The next author who made any considerable improvement in this theory was De Moivre, to whom we owe the doctrine of RECURRING SERIES, on the principles of which we have spoken at some length under that article of the present work; we shall not therefore enter again upon the subject in this place, but confine ourselves to an illustration of his method for finding summable series, which is not referred to in the article above mentioned; it was first given by him in his "Miscellanea Analytica," 1730.

Let there be assumed any series, and let this be multiplied by any binomial or trinomial factor, such that the resulting series shall have its powers of x recurring again in the same order; then, by equating the resulting series to 0, and transposing the negative terms, a new numerical series will arise, the sum of which will be given.

Thus, let there be taken the series

$$1 + \frac{1}{2}x + \frac{1}{3}x^2 + \frac{1}{4}x^3 + \frac{1}{5}x^4 + \&c. = S.$$

Multiplying this by $x - 1$, we have

$$-1 + \frac{1}{1 \cdot 2}x + \frac{1}{2 \cdot 3}x^2 + \frac{1}{3 \cdot 4}x^3 + \&c. = (x-1)S.$$

Whence, making $x - 1 = 0$, or $x = 1$, we have

$$\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \frac{1}{4 \cdot 5} + \&c. = 1.$$

Again, assume

$$1 + \frac{1}{2}x + \frac{1}{3}x^2 + \frac{1}{4}x^3 + \&c. = S.$$

Multiplying by $x^2 - 1$, we have

$$-1 - \frac{1}{2}x + \frac{2}{1 \cdot 3}x^2 + \frac{2}{2 \cdot 4}x^3 + \frac{2}{3 \cdot 5}x^4 + \&c. = (x^2-1)S$$

where making again $x = 1$, we have

$$\frac{2}{1 \cdot 3} + \frac{2}{2 \cdot 4} + \frac{2}{3 \cdot 5} + \frac{2}{4 \cdot 6} + \frac{2}{5 \cdot 7} + \&c. = \frac{3}{2}, \text{ or}$$

$$\frac{1}{1 \cdot 3} + \frac{1}{2 \cdot 4} + \frac{1}{3 \cdot 5} + \frac{1}{4 \cdot 6} + \frac{1}{5 \cdot 7} + \&c. = \frac{3}{4}.$$

As another example, let the same series

$$1 + \frac{1}{2}x + \frac{1}{3}x^2 + \frac{1}{4}x^3 + \frac{1}{5}x^4 + \&c. = S$$

be multiplied by

$$(2x-1)(3x-1) = 6x^2 - 5x + 1,$$

and we have

$$1 - \frac{9}{1 \cdot 2}x + \frac{23}{1 \cdot 2 \cdot 3}x^2 + \frac{38}{2 \cdot 3 \cdot 4}x^3 + \frac{57}{3 \cdot 4 \cdot 5}x^4 + \&c.$$

$$= (2x-1)(3x-1)S;$$

where, by making $x = \frac{1}{2}$, and $x = \frac{1}{3}$, we have the two following series:

$$1. \frac{23}{1 \cdot 2 \cdot 3} \cdot \frac{1}{4} + \frac{38}{2 \cdot 3 \cdot 4} \cdot \frac{1}{8} + \frac{57}{3 \cdot 4 \cdot 5} \cdot \frac{1}{16} + \&c. = \frac{5}{4}$$

$$2. \frac{23}{1 \cdot 2 \cdot 3} \cdot \frac{1}{9} + \frac{38}{2 \cdot 3 \cdot 4} \cdot \frac{1}{27} + \frac{57}{3 \cdot 4 \cdot 5} \cdot \frac{1}{81} + \&c. = \frac{1}{2}$$

The law of both which series is obvious, the numerators being in arithmetical progression. This method is not much different in principle from the second method of Bernoulli above explained.

5. *Stirling's Method of Series.* In the recurring series of De Moivre, each term is connected with a certain number of the preceding terms, by a constant and invariable law, but in the series considered by Stirling, in his "Methodus Differentialis," 1730, each term is a certain function of the number of terms from the beginning, or from some determinate term of the series; which function may therefore be considered as the general term, and the method of summation depends on the following principles.

Having first determined the general term of the series in some function of x , its distance from the beginning, or some determinate term of the series; it follows, that the sum of all the terms to that place will also be some function of x . Therefore, if x' is made to denote the distance of any other term from the same point, the sum to that term will be the same function of x' , as the other sum is of x ; and each term of the series may be considered to represent the difference between two consecutive sums, or the difference between two similar functions, viz. of $x-1$ and x ; and the object of the author is to determine what those sums or functions are from the difference between them being given.

To be a little more explicit, if there be any series of quantities

$$a, b, c, d, \dots t^0, t, t', \&c.$$

proceeding from the first a , by any uniform law, either increasing or decreasing; and if x be taken to represent the distance of any term, as t , from the beginning of the series, or from any term in the same, then will t be expressible by some function of x ; t' by the same function of $x+1$; t'' by the same function of $x+2$, &c.: denoting therefore this function by $f(x)$, we shall have

$$t^0 = f(x-1), t = f(x), t' = f(x+1), \&c.$$

Also if $f^0, f, f', f'', \&c.$ denote the sums of all the terms from the beginning to the terms $t^0, t, t', \&c.$ respectively, these several sums will also be some function of $x-1, x, x+1, x+2, \&c.$ which we may denote by

$$f^0 = \phi(x-1), f = \phi(x), f' = \phi(x+1):$$

whence we draw immediately

$$f - f^0 = t, \text{ or } \phi(x) - \phi(x-1) = f(x).$$

Now

SERIES.

Now the function $f(x)$ is given, being the general term of the series, and the object of enquiry is, from this given function to determine the two functions $\phi(x)$ and $\phi(x-1)$, of which it is the difference; for the former of these, $\phi(x)$, will then be the sum of the series to the term x inclusive.

To illustrate this by a familiar example; let the proposed series be

$$1 + 3 + 5 + 7 + 9, \&c.$$

the general term of which is $2x - 1$; therefore,

$$\phi(x) - \phi(x-1) = 2x - 1;$$

whence we have obviously $\phi(x) = x^2$, for

$$x^2 - (x-1)^2 = 2x - 1;$$

therefore x^2 is the sum of x terms of the above series.

Again, let it be required to find the sum of x terms of the series

$$1, 7, 19, 37, \&c.$$

of which the general term

$$f(x) = 3x^2 - 3x + 1,$$

therefore,

$$\phi(x) - \phi(x-1) = 3x^2 - 3x + 1;$$

consequently $\phi(x) = x^3$, the sum of x terms of the series.

In these two examples, the finding the sum $\phi(x)$ from the difference is extremely simple; but in the generality of cases it is far from being so obvious, and even in some, it is impossible to exhibit the sum of the series in any other manner than by another series; but as in the latter case the transformed series may be made to possess almost any degree of convergency we please, this method of summation is still attended with important advantages, and even more perhaps in the latter case, than in any other; because most, if not all, summable series, may be summed on some other principles; viz. either by the method of *recurring series*, or by the *differential method*, or by *increments*; while the transformation of a slowly converging series, into another of rapid convergency, is frequently extremely difficult to effect on any other principle than that of Stirling's, or some other tantamount to it.

From what is stated above it appears, that the principal object of enquiry is, in what manner we are to determine a function from the difference between two states of it being given. In the examples we have chosen for illustration, the function whence the difference is derived is extremely obvious; but this in many cases is, as we have before observed, attended with some difficulty. In this respect the summation of series resembles in a great degree the inverse method of fluxions. There is little or no difficulty in any case in finding the fluxions of any proposed quantity; but the finding of a fluent of any given fluxion is far from possessing the same facility. So also in the present case, if the question was to find the difference between two different states of a given function, we should find the operation direct and simple; but the converse, or the finding the function from the difference being known, is indirect, and frequently difficult to be determined.

It is obvious also, that two different functions, which differ from each other only by some constant quantity, will give the same difference, and, consequently, a given difference may give rise to different functions, the same as happen in finding fluents, and it will therefore be necessary in this case, as in that, to have recourse to a *correction*, which will be found in the same manner as is practised in that calculus,

viz. by finding the value of the series, when the variable quantity is made equal to zero, or some determined magnitude.

Of the general Term of a Series.—With regard to the general term of a series, it is difficult, particularly within our limits, to lay down any fixed or constant rule for its determination; it is besides seldom necessary, as the law of the series is commonly presented in the *terms of the series itself*; we shall leave this determination, therefore, as in fact it must be in most cases, to the ingenuity of the analyst, and shall proceed immediately to the other subjects of investigation.

It may not, however, be amiss to state; that in such series as have any order of their differences vanish, the general term is always of the form

$$A n^m + B n^{m-1} + C n^{m-2} + D n^{m-3} + \&c.$$

where m denotes the order of the differences that vanish, and n the number of terms from the beginning. The values of $A, B, C, D, \&c.$ being found by making n successively equal to $1, 2, 3, \&c.$, and equating the results with the 1st, 2d, 3d, &c. terms of the series.

Of the Transformation of a given Function to an equivalent one of a different Form.—Since we shall confine our investigation only to those series whose terms are either integers or rational fractions, it is obvious that the general term must also be some rational function either of the form,

$$a + bx + cx^2 + dx^3 + \&c. \text{ or}$$

$$\frac{a + bx + cx^2 + dx^3 + \&c.}{a' + b'x + c'x^2 + d'x^3 + \&c.}$$

and our object is to transform either of those general forms into others, whence the general function from which they have been derived may be the more readily determined. Different transformations may be employed for this purpose; but the most general, and that, in fact, to which Stirling principally confines himself, is to transform the above general terms into other equivalent ones of the form

$$A + Bx + Cx(x-1) + Dx(x-1)(x-2) + \&c. \text{ or}$$

$$\frac{A}{x(x+1)} + \frac{B}{x(x+1)(x+2)} + \frac{C}{x(x+1)(x+2)(x+3)}$$

from either of which the general function whence they have been derived may be readily determined. For it is obvious that the first is equal to the difference between the two similar functions

$$Ax + \frac{1}{2}B(x+1)x + \frac{1}{6}C(x+1)x(x-1) + \frac{1}{24}D(x+1)x(x-1)(x-2) + \&c.$$

and

$$A(x-1) + \frac{1}{2}Bx(x-1) + \frac{1}{6}Cx(x-1)(x-2) + \frac{1}{24}Dx(x-1)(x-2)(x-3) + \&c.$$

For by subtracting these one from the other, we have

$$A + Bx + Cx(x-1) + Dx(x-1)(x-2) + \&c.$$

And therefore, from what has been stated, the first of the above formulæ will be the general sum of that series of which the general term is

$$A + Bx + Cx(x-1) + Dx(x-1)(x-2) + \&c.$$

And in a similar manner it may be shewn, that the second general form is equal to the difference between the two similar functions

SERIES.

$$\frac{A}{x} + \frac{B}{2x(x+1)} + \frac{C}{3x(x+1)(x+2)} + \frac{D}{4x(x+1)(x+2)(x+3)} + \&c.$$

and

$$\frac{A}{1+x} + \frac{B}{2(x+1)(x+2)} + \frac{C}{3(x+1)(x+2)(x+3)} + \frac{D}{4(x+1)\dots(x+4)} + \&c.$$

For by subtracting these one from the other, we have

$$\frac{A}{x(x+1)} + \frac{B}{x(x+1)(x+2)} + \frac{C}{x(x+1)(x+2)(x+3)} + \&c.$$

and consequently the former is the sum of that series whose general term is

$$\frac{A}{x(x+1)} + \frac{B}{x(x+1)(x+2)} + \frac{C}{x(x+1)(x+2)(x+3)} + \&c.$$

So that the whole difficulty is now reduced to that of transforming any proposed function, expressing the general term of a series into an equivalent function of one or other of the above forms.

To transform a quantity of the form

$$a + bx + cx^2 + dx^3 + ex^4 + \&c.$$

into another of the form

$$A + Bx + Cx(x-1) + Dx(x-1)(x-2) + \&c.$$

By the actual multiplication of the latter formula, we have

$$A = A$$

$$Bx = Bx$$

$$Cx(x-1) = -Cx + Cx^2$$

$$Dx(x-1)(x-2) = Dx - 3Dx^2 + Dx^3$$

And equating the co-efficients of the like powers of x in this and the original series, we obtain

$$\left. \begin{array}{l} d = D \\ c = C - 3D \\ b = B - C + D \\ a = A \end{array} \right\} \text{ or } \left\{ \begin{array}{l} D = d \\ C = c + 3d \\ B = b + c + 2d \\ A = a \end{array} \right.$$

Whence the values of $A, B, C, D, \&c.$ are determined by means of the known co-efficients $a, b, c, d, \&c.$ And the same method may obviously be employed in any other similar case. The following tablet, however, will facilitate the operation; *viz.*

$$\begin{array}{l} x = x \\ x^2 = x + x(x-1) \end{array}$$

Now

$$\frac{1}{x^2} = \frac{1}{x(x+1)} + \frac{1}{x(x+1)(x+2)} + \frac{2}{x(x+1)(x+2)(x+3)} + \frac{6}{x(x+1)\dots(x+4)} + \&c.$$

$$\frac{1}{x^3} = \frac{1}{x(x+1)(x+2)} + \frac{3}{x(x+1)(x+2)(x+3)} + \frac{11}{x(x+1)\dots(x+4)} + \&c.$$

$$\frac{1}{x^4} = \frac{1}{x(x+1)(x+2)(x+3)} + \&c. \&c.$$

Or by making

$$\begin{array}{l} A = \alpha \\ B = \alpha + \gamma \\ C = 2\alpha + 3\beta + \gamma \\ D = 6\alpha + 11\beta + 6\gamma + \delta \\ E = 24\alpha + 50\beta + 35\gamma + 10\delta + \epsilon \\ F = 120\alpha + 274\beta + 225\gamma + 85\delta + 15\epsilon + \theta \end{array}$$

$$\begin{array}{l} x^3 = x + 3x(x-1) + x(x-1)(x-2) \\ x^4 = x + 7x(x-1) + 6x(x-1)(x-2) + x(x-1)(x-2)(x-3) \\ \&c. = \&c. \end{array}$$

As an example, let

$$1 + 3x + 4x^2$$

be the proposed general term. Here

$$3x = 3x$$

$$4x^2 = 4x + 4x(x-1)$$

therefore,

$$1 + 3x + 4x^2 = 1 + 7x + 4x(x-1)$$

which latter is of the form required.

To transform any general term of the form

$$\frac{a + bx + cx^2 + dx^3 + \&c.}{a' + b'x + c'x^2 + d'x^3 + \&c.}$$

into another of the form

$$\frac{A}{x(x+1)} + \frac{B}{x(x+1)(x+2)} + \frac{C}{x(x+1)(x+2)(x+3)} + \&c.$$

The most general method of performing this transformation is, by actual division to reduce it first to the form

$$\frac{\alpha}{x^2} + \frac{\beta}{x^3} + \frac{\gamma}{x^4} + \frac{\delta}{x^5} + \&c.$$

which

SERIES.

which values substituted for A, B, C, &c. will give the transformation sought, and which will terminate by one of those expressions becoming zero, when the series is summable, but when it is not the expression itself will become an infinite series, but such that we may give to it almost any degree of convergency at pleasure.

Let us now illustrate what has been said by a few examples, remembering that the sum of a series, whose general term is

$$\begin{aligned} A + Bx + Cx(x-1) + Dx(x-1)(x-2), = \\ Ax + \frac{1}{2}B(x+1)x + \frac{1}{3}C(x+1)x(x-1) + \&c. \\ \text{Let it be proposed to sum the series of odd numbers,} \\ 1 + 3 + 5 + 7 + \&c. \end{aligned}$$

Here the general term is $2x-1$, or $-1+2x$; so that $a = -1$ and $b = 2$: whence $A = -1$, and $B = 2$, and $C = 0$; whence $Ax + \frac{1}{2}B(x+1)x = -x + x^2 - x = x^2$, which is the known expression for the sum of x terms of the above series.

Again, require the sum of the series,

$$1 \cdot 2 + 2 \cdot 3 + 3 \cdot 4 + 4 \cdot 5 + \&c.$$

Here the general term is $x(x+1)$, or x^2+x : by the preceding tablet,

$$\left. \begin{aligned} x &= x \\ x^2 &= x + x(x-1) \end{aligned} \right\} = 2x + x(x-1).$$

Therefore $A = 0$, $B = 2$, and $C = 1$; whence we have

$$\begin{aligned} \frac{1}{2}B(x+1)x + \frac{1}{3}C(x+1)x(x-1) = \\ (x+1)x + \frac{1}{3}(x+1)x(x-1) = \\ \frac{1}{3}(x^3 + 3x^2 + 2x), \text{ the sum of } x \text{ terms, as required.} \end{aligned}$$

But as there is no advantage gained by the application of this method to series of the above kind, nor indeed to any summable series, as these are commonly more readily resolved by some one of the preceding methods than by this, we shall pass immediately to series of the second kind, in which it possesses a facility of application, which is perhaps unattainable by any other principle at present known.

Here we must observe, that after the general term of any series is reduced to the form,

$$\frac{A}{x(x+1)} + \frac{B}{x(x+1)(x+2)} + \frac{C}{x(x+1)(x+2)(x+3)} + \&c.$$

the sum of that series is expressed by

$$\frac{A}{x} + \frac{B}{2x(x+1)} + \frac{C}{3x(x+1)(x+2)} + \&c.$$

$$\frac{1}{4x(x+1)} + \frac{1}{8x(x+1)(x+2)} + \frac{1 \cdot 3}{16x(x+1)(x+2)(x+3)} + \frac{1 \cdot 3 \cdot 5}{32x(x+1)(x+2)(x+3)(x+4)} + \&c.;$$

where the law of continuation is obvious, and the sum will be expressed by

$$\frac{1}{4x} + \frac{1}{16x(x+1)} + \frac{1 \cdot 3}{48x(x+1)(x+2)} + \frac{1 \cdot 3 \cdot 5}{128x(x+1)(x+2)(x+3)} + \&c.;$$

in which the law is also obvious, the co-efficients in the denominator being $4 = 2^2$, $16 = 2^4$, $48 = 2^4 \times 3$, $128 = 2^7$, &c.; but the series will not terminate, because the original general term $\frac{1}{4x(x+\frac{1}{2})}$ includes the fraction $\frac{1}{2}$.

1. Let it be proposed to find the sum of the infinite series,

$$\frac{1}{1 \cdot 4 \cdot 7} + \frac{1}{4 \cdot 7 \cdot 10} + \frac{1}{7 \cdot 10 \cdot 13} + \&c.$$

where the general term is

$$\frac{1}{3x(3x+3)(3x+6)} = \frac{1}{27x(x+1)(x+2)};$$

x being successively $\frac{1}{3}$, $1\frac{1}{3}$, $2\frac{1}{3}$, &c.

Now this is of the required form, A being $= 0$, and

$$B = \frac{1}{27}; \text{ therefore the required sum is } \frac{1}{54x(x+1)} = \frac{1}{24},$$

by taking $x = \frac{1}{3}$, its first value. If we took $x = 1\frac{1}{3}$, we should have the sum of all the terms of the series, except the first; if $x = 2\frac{1}{3}$, we should have the sum of all but the two first terms, and so on: and it is by this means that we are enabled to give so great a degree of convergency in those series that are not summable; for we may assume any one of the values of x , and by that means give almost any magnitude to the denominators of our converging fractions; observing only, that such of the leading terms of the series as are not included must be summed by themselves, and added to the approximation found as above. As this is the great characteristic of Stirling's method, we shall confine our future remarks to one or two examples, which are not summable, in order to illustrate the nature of his approximations.

Let there be proposed the series,

$$\frac{1}{1 \cdot 2} + \frac{1}{3 \cdot 4} + \frac{1}{5 \cdot 6} + \frac{1}{7 \cdot 8} + \&c.;$$

which is that found by lord Brouncker, for the quadrature of the hyperbola.

Here the general term is

$$\frac{1}{2x(2x+1)}, \text{ or } \frac{1}{4x(x+\frac{1}{2})} = \frac{1}{4x^2+2x};$$

taking $x = \frac{1}{2}$, $1\frac{1}{2}$, $2\frac{1}{2}$, &c. Now

$$\frac{1}{4x^2+2x} = \frac{1}{4x^2} - \frac{1}{8x^3} + \frac{3}{16x^4} - \frac{1 \cdot 3 \cdot 5}{32x^5} + \&c.;$$

that is,

$$A = \frac{1}{4}, B = \frac{1}{8}, C = \frac{3}{16}, D = \frac{-1 \cdot 3 \cdot 5}{32}, \&c.;$$

whence $\frac{1}{4x^2+2x}$, when converted into the required form, is,

The original series has, therefore, been converted into another infinite series, but with this advantage attending the latter, that we may give it almost any degree of convergency at pleasure, according to the value we give to x . If we assume $x = 13\frac{1}{2}$, which is its value in the 14th term, then the preceding series will exhibit the sum of the original series

SERIES.

series from that term, to which adding the sum of the first 13 terms, we have, for the whole sum,

$$\begin{array}{rcl} 13 \text{ first terms} & - & = .674285961 \\ 9 \text{ first terms of the new series} & = & .018861219 \\ \hline \text{Whole sum} & - & = .693147180 \end{array}$$

This is true to nine places of decimals, which, if we had used the original series, would have required the summation of at least *one hundred million* of its terms.

Hence the advantage of this transformation, which con-

Now, from what has been said, it appears that

$$\frac{1}{x^2} = \frac{1}{x(x+1)} + \frac{1}{x(x+1)(x+2)} + \frac{1 \cdot 2}{x(x+1)(x+2)(x+3)} + \frac{1 \cdot 2 \cdot 3}{x(x+1)(x+2)(x+3)(x+4)} + \&c.;$$

and consequently the sum will be

$$\frac{1}{x} + \frac{1}{2x(x+1)} + \frac{1 \cdot 2}{3x(x+1)(x+2)} + \frac{1 \cdot 2 \cdot 3}{4x(x+1)(x+2)(x+3)} + \&c.;$$

in which substituting 13 for x , viz. its 13th value, we find, by summing 13 terms of the new series, and adding that sum = .079957427, to the sum of the first 12 terms of the original series, viz. 1.564976638, we have 1.644934065 for the whole approximate sum, true to nine places of decimals.

Our limits will not allow of our entering farther upon this method, and we shall therefore conclude our illustration of it, by merely giving the author's formula for the summation of those series, in which the successive powers of an

$$x^{z+n} \times \left\{ \frac{a}{(1-x)z} + \frac{b - Ax}{(1-x)z(z+1)} + \frac{c - 2Bx}{(1-x)z(z+1)(z+2)} + \frac{d - 3Cx}{(1-x)z(z+1)(z+2)(z+3)} + \&c. \right\}^i$$

where A, B, C, &c. represent the terms immediately preceding those in which they are found.

This latter expression, like those in the preceding propositions, will terminate when the series is summable: in other cases, it will be itself an infinite series, but such that we may give to it any degree of convergency required.

Simpson's Method of Series.—In 1743 Simpson published his "Mathematical Dissertations on a variety of Physical and Analytical Subjects," and amongst other interesting researches in that work, there is one relating to the summation of series, which is perhaps as general and complete as any we have yet noticed; at least, if we except (with regard to approximations) that of Stirling's, above explained. This method consists in deriving the sum of one series from that of another being given or known; which former sum is expressed by a finite or infinite formula, according as the successive differences of certain parts of its terms are of definite or indefinite extent; thus, if

$$a^n + b a^{n-1} x + c a^{n-2} x^2 + d a^{n-3} x^3 + \&c.$$

be any power (n) of the binomial $a + x$, n being either integral, fractional, positive, or negative; and the terms of it be respectively multiplied by any series of quantities, p, q, r, s , &c.; and we make $q - p = D'$, $r - 2q + p = D''$, &c. viz. D' , D'' , D''' , &c. being the first terms of the successive orders of differences, then will the sum of

$$a^n p + b a^{n-1} x \cdot q + c a^{n-2} x^2 r + d a^{n-3} x^3 s + \&c.$$

be expressed by

$$p(a+x)^n + D' b x (a+x)^{n-1} + D'' c x^2 (a+x)^{n-2} + D''' d x^3 (a+x)^{n-3} + \&c.;$$

which formula will obviously be finite, if any order of the

VOL. XXXII.

fits in our being able, by the summation of a few of the leading terms of the original series, to give any degree of convergency to our transformed series, and thereby to perform the same upon a few terms, as would require the labour of ages to effect upon the series in its original form.

As another example, let the series,

$$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \&c.$$

be proposed, in which the general term is $\frac{1}{x^2}$.

indeterminate quantity enter; all those which we have at present considered, having been wholly numerical. The formula for this purpose is as follows.

If the terms of any series be formed by writing any number, differing by unity, for z in the quantity,

$$x^{z+n} \times \left\{ \frac{a}{z} + \frac{b}{z(z+1)} + \frac{c}{z(z+1)(z+2)} + \&c. \right\};$$

then the sum will be expressed by

differences, D' , D'' , D''' , &c. become zero; but, in other cases, the new series will also be infinite, the same as that from which it is derived.

By giving to a, x , and n different values, and to the series p, q, r, s , &c. different laws, a great variety of particular cases may be deduced, which our limits, however, will not admit of detailing.

Again, representing $(a+x)^n$, as before, by

$$a^n + b a^{n-1} x + c a^{n-2} x^2 + d a^{n-3} x^3 + \&c.$$

if r be any positive number, and we make $S = (a+x)^{n+r}$ minus its first r terms, then will the sum of the series

$$\frac{a^n}{1 \cdot 2 \cdot 3 \dots r} + \frac{b a^{n-1} x}{2 \cdot 3 \cdot 4 \dots (r+1)} + \frac{c a^{n-2} x^2}{3 \cdot 4 \cdot 5 \dots (r+2)} + \&c.$$

whether finite or infinite, be expressed by

$$\frac{S}{(n+1)(n+2)(n+3) \dots (n+r) x^r}$$

From which general formula a great variety of particular cases may be drawn, according to the different values that are given to a, x , and n .

Again, let the sum of the series

$$a x^p + b x^{p+n} + c x^{p+2n} + d x^{p+3n} + \&c. = A$$

and the terms be respectively multiplied by the terms of the arithmetical progression $r, r+n, r+2n$, then will the sum of the series thence arising (B), viz.

$$r a x^p + (r+n) b x^{p+n} + (r+2n) c x^{p+2n} + \&c.$$

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SERIES.

be expressed by the fluxional formula

$$(r-p) A + \frac{x \dot{A}}{x} = B;$$

where, because it is given in finite terms, \dot{A} will always likewise be had in finite terms, and consequently, also, the value of B . And in the same manner as we have

$$a x^p + b x^{p+n} + c x^{p+2n} + \&c. = A$$

$$r a x^p + (r+n) b x^{p+n} + (r+2n) c x^{p+2n} + \&c. =$$

$$(r-p) A + \frac{x \dot{A}}{x} = B;$$

so also

$$r s a x + (r+n)(s+n) b x^{p+n} + (r+2n)(s+2n) c x^{p+2n} + \&c. =$$

$$(s-p) B + \frac{x \dot{B}}{x} = C \&c. \&c.$$

The three preceding cases are the first, second, and third propositions in the author's chapter on series, which contains four other propositions equally general and important; but for these we must refer the reader to the tract itself.

Since the publication of Simpson's work above referred to, a variety of other treatises have appeared either wholly or in part devoted to this subject, besides numerous memoirs in all the principal academies and learned societies in Europe. It will be impossible to enter upon these at any considerable length within the limits of this article, and we shall therefore merely select two or three of the principal authors whose methods are the most eligible for the purposes of general summation.

Euler, in this, as in every other branch of analysis, has distinguished himself by the many new lights he has thrown upon this theory, and the general and elegant investigations that he has given of many very interesting problems relating to this doctrine. These investigations are found in various memoirs in the *Acta Petrop.* and in his "Institutiones calculi differentialis," as also in the first volume of his "Introductio in Analysin Infinitorum;" many of these, however, may be referred to the *Method of INCREMENTS and RECURRING SERIES*, which have been already treated of under those articles; the theory of circular series is also handled in his usually masterly manner, but for our purpose we shall prefer adopting the method employed by Landen in his "Mathematical Lucubrations," and shall therefore, in this place, limit our observations to Euler's differential method.

Euler's Differential Method of Series.—Let there be proposed the general series

$$S = a x + b x^2 + c x^3 + d x^4 + \&c.$$

in which $a, b, c, d, \&c.$ are constant and positive quantities, x being indeterminate. This series Euler transforms into the following equivalent series, viz.

$$S = \frac{x}{1-x} a + \frac{x^2}{(1-x)^2} \Delta a + \frac{x^3}{(1-x)^3} \Delta^2 a + \frac{x^4}{(1-x)^4} \Delta^3 a + \&c.$$

in which $\Delta a, \Delta^2 a, \Delta^3 a,$ denote the first terms of the first, second, third, &c. differences of $a, b, c, \&c.$ observing that the leading term is always supposed to be taken from the following, so that when the terms diminish, this difference will be negative. It is obvious here, as in the other differential series we have had occasion to notice, that when

any order of differences vanish, the transformed series will be finite, but in other cases infinite, the same as that whence it is derived.

Let, for example, the series

$$S = x + 2 x^2 + 3 x^3 + 4 x^4 + \&c.$$

be the one proposed. Here the first differences are 1, 1, 1, &c. and, consequently, the second differences are zero; that is, we have $a = 1$, and $\Delta a = 1$; so that we have

$$S = \frac{x}{1-x} a + \frac{x^2}{(1-x)^2} \Delta a = \frac{x}{(1-x)^2}.$$

Hence, by substituting $x = 1, \frac{1}{2}, \frac{1}{3}, \&c.$ we obtain

$$x = 1; S = 1 + 2 + 3 + 4 + \&c. = \frac{1}{(1-1)^2} = \infty$$

$$x = \frac{1}{2}; S = \frac{1}{2} + \frac{2}{4} + \frac{3}{8} + \frac{4}{16} + \&c. = \frac{\frac{1}{2}}{(1-\frac{1}{2})^2} = 2$$

$$x = \frac{1}{3}; S = \frac{1}{3} + \frac{2}{9} + \frac{3}{27} + \frac{4}{81} + \&c. = \frac{\frac{1}{3}}{(1-\frac{1}{3})^2} = \frac{3}{4}$$

Again, let the proposed series be

$$S = x + 3 x^2 + 5 x^3 + 7 x^4 + \&c.$$

Here $a = 1, \Delta a = 2, \Delta^2 a = 0$; therefore

$$S = \frac{x}{1-x} a + \frac{x^2}{(1-x)^2} \Delta a = \frac{x^2 + x}{(1-x)^2}.$$

Making therefore, as before, $x = 1, \frac{1}{2}, \frac{1}{3}, \&c.$ we have

$$x = 1; S = 1 + 3 + 5 + 7 + \&c. = \frac{1+1}{(1-1)^2} = \infty$$

$$x = \frac{1}{2}; S = \frac{1}{2} + \frac{3}{4} + \frac{5}{8} + \frac{7}{16} + \&c. = \frac{\frac{1}{2} + \frac{1}{2}}{(1-\frac{1}{2})^2} = 3$$

$$x = \frac{1}{3}; S = \frac{1}{3} + \frac{3}{9} + \frac{5}{27} + \frac{7}{81} + \&c. = \frac{\frac{1}{3} + \frac{1}{3}}{(1-\frac{1}{3})^2} = 1$$

Without farther examples, it is obvious, that a most extensive class of summable series may be drawn from this one simple principle, by merely changing the values of x ; and those of $a, b, c, d, \&c.$ being so assumed, that a certain order of their difference may vanish, which will always happen, if they be made to represent any order of polygonal or figurate numbers, or any order of powers whatever. This method, however, is not limited to finding summable series, it may frequently be employed to great advantage in approximating towards the real value of slowly converging series that are not summable in any finite form, as for example, the series

$$1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \&c. = \text{hyp. log. } 2;$$

putting this under the form

$$S = x + \frac{1}{2} x^2 + \frac{1}{3} x^3 + \frac{1}{4} x^4 + \&c.$$

we have $a = 1, \Delta a = -\frac{1}{2}, \Delta^2 a = \frac{1}{3}, \Delta^3 a = -\frac{1}{4} \&c.$

whence

$$S = \frac{x}{1-x} a + \frac{x^2}{(1-x)^2} \Delta a + \frac{x^3}{(1-x)^3} \Delta^2 a + \&c.$$

will

will become, by making $x = -1$,

$$S = \frac{-1}{2} - \frac{1}{2 \cdot 4} - \frac{1}{3 \cdot 8} - \frac{1}{4 \cdot 16} - \frac{1}{5 \cdot 32} - \&c. = -1 + \frac{1}{2} - \frac{1}{3} + \frac{1}{4} - \frac{1}{5} + \&c.$$

whence, by changing signs, we have

$$1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \&c. = \text{hyp. log. } 2 \\ = \frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 4} + \frac{1}{3 \cdot 8} + \frac{1}{4 \cdot 16} + \frac{1}{5 \cdot 32} + \&c.$$

which latter series, though indefinite like the first, is so much more converging, that 25 terms of it will give a result as true as 10,000 terms of the original series.

The same formula is also applicable to certain diverging series, but we can only give some of the most remarkable results, as

$$\begin{aligned} 1 - 1 + 1 - 1 + 1 - 1 + \&c. &= \frac{1}{2} \\ 1 - 2 + 3 - 4 + 5 - 6 + \&c. &= \frac{1}{4} \\ 1 - 4 + 9 - 16 + 25 - \&c. &= 0 \\ 1 - 3 + 9 - 27 + 81 - \&c. &= \frac{1}{4} \\ 1 - 1 \cdot 2 + 1 \cdot 2 \cdot 3 - 1 \cdot 2 \cdot 3 \cdot 4 + 1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 - \&c. &= 0.5963473621237 \end{aligned}$$

Euler also employed other methods for summable series, which we have not referred to either in the above article, or in the articles INCREMENTS OR RECURRING Series, one of the most general of which is by means of certain fluxional operations; but as this has been carried to a greater extent by Lorgna, in his tract "de Seriebus convergentibus," we shall defer any further mention of it till we come to an explanation of Lorgna's method.

We ought to give here some account of the differential method of Maferes and Hutton, but our article having already been carried to a greater extent than is usual for mathematical subjects, we must limit ourselves to giving merely the theorems, and leave the application of them to the ingenuity of the reader.

8. Maferes differential Formula for slowly converging Series.

Let $a + bx + cx^2 + dx^3 + \&c.$

represent any series, and D' , D'' , D''' , &c. the first terms of the successive order of differences of the co-efficients a, b, c, d , &c. which are supposed continually to diminish, then will the sum of the above series be expressed by the differential series

$$a - \frac{b}{1+x} - \frac{D'x^2}{(1+x)^2} - \frac{D''x^3}{(1+x)^3} - \&c.$$

which is necessarily converging, provided x be equal to, or greater than unity. By means of this series, the author finds the circumference of the circle from the series

$$1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \&c.$$

true to seven places of decimals, by the summation of ten terms, whereas, in its original form, 10,000 of its terms will only give two decimals correct. For a further illustration of this method, the reader is referred to the Phil. Trans. for 1775, or to the author's Treatise on Converging Series.

9. Hutton's Method for slowly converging Series.—This method applies only to those series whose terms are alternately plus and minus, as $a - b + c - d + \&c.$ the total sum of which series is given alternately in excess and defect,

by the successive quantities $\frac{a}{2}, \frac{3a-b}{4}, \frac{7a-4b+c}{8},$
 $\frac{15a-11b+3c-d}{16}, \frac{31a-26b+16c-6d+e}{32},$

&c.; each of these quantities, as we have stated above, is an approximation towards the whole sum; the first in excess, the second in defect, the third in excess, and so on; but each is a nearer approximation than the preceding. The general formula for n terms is

$$\frac{1}{2^n} \left\{ (2^n - 1)a - (A - n)b - \left(B - \frac{n(n-1)}{1 \cdot 2} \right) c - \left(C - \frac{n(n-1)(n-2)}{1 \cdot 2 \cdot 3} \right) d - \&c. \right\}$$

The method of applying this formula to computation, however, is such, that we must refer the reader for an explanation of it to the author's Miscellaneous Tracts, published in 4to. in 1778, or to the new edition of the same in 3 vols. 8vo. published in 1812.

10. Lorgna's Method of Series.—This consists in multiplying the terms of the proposed series by such powers of an indeterminate quantity, that the fluxion of the whole series being taken, and then divided by x , there shall result a known series, from which the sum of the original one may be readily derived. Thus, let there be proposed the series,

$$\frac{1}{p+q} + \frac{1}{p+2q} + \frac{1}{p+3q} + \&c.$$

Multiply each term successively by

$$\frac{x^{\frac{p}{q}+1}}{x^{\frac{p}{q}}}, \frac{x^{\frac{p}{q}+2}}{x^{\frac{p}{q}}}, \frac{x^{\frac{p}{q}+3}}{x^{\frac{p}{q}}}, \&c.;$$

and there results

$$\frac{x^{\frac{p}{q}+1}}{x^{\frac{p}{q}}(p+q)} + \frac{x^{\frac{p}{q}+2}}{x^{\frac{p}{q}}(p+2q)} + \frac{x^{\frac{p}{q}+3}}{x^{\frac{p}{q}}(p+3q)} + \&c.$$

Make the sum of this series = S , and then taking the fluxion on both sides, we have

$$\frac{q \dot{S}}{x} = x^{\frac{p}{q}} + x^{\frac{p}{q}+1} + x^{\frac{p}{q}+2} + x^{\frac{p}{q}+3} + \&c.$$

$$\text{or } \frac{q \dot{S}}{x^{\frac{p}{q}} \dot{x}} = 1 + x + x^2 + x^3 + \&c. = \frac{1}{1-x};$$

whence $\dot{S} = \frac{x^{\frac{p}{q}} \dot{x}}{q(1-x)}$; and consequently,

$$S = \int \frac{x^{\frac{p}{q}} \dot{x}}{1-x} = \frac{x^{\frac{p}{q}+1}}{p+q} + \frac{x^{\frac{p}{q}+2}}{p+2q} + \frac{x^{\frac{p}{q}+3}}{p+3q};$$

which, by making $x = 1$, becomes the same as the series originally proposed, viz.

$$\frac{1}{p+q} + \frac{1}{p+2q} + \frac{1}{p+3q} + \frac{1}{p+4q} + \&c.$$

It must be observed, however, that in all such expressions, the fluent must be so taken, as to vanish when $x = 0$, and to be perfectly integral when $x = 1$.

By a similar process, the author finds the sum of the series,

$$\frac{1}{p+q} - \frac{1}{p+2q} + \frac{1}{p+3q} - \frac{1}{p+4q} + \&c.$$

SERIES.

to be equal to $\frac{1}{q} \int \frac{x^{\frac{p}{q}} \dot{x}}{1+x}$; the fluent being taken under

the same restriction as before. And in nearly the same way he finds the sum of n terms of the former to be

$$\Sigma = \frac{1}{q} \left\{ \int \frac{x^{\frac{p}{q}} \dot{x}}{1-x} - \int \frac{x^{\frac{p+qn}{q}} \dot{x}}{1-x} \right\}$$

and the latter,

$$\Sigma = \frac{1}{q} \left\{ \int \frac{x^{\frac{p}{q}} \dot{x}}{1+x} - \int \frac{x^{\frac{p+qn}{q}} \dot{x}}{1+x} \right\}$$

In a similar manner, M. Lorgna finds for the infinite sum of

$$\frac{1}{(p+q)m} \pm \frac{1}{(p+2q)m^2} + \frac{1}{(p+3q)m^3} \pm \&c. -$$

$$S = \frac{1}{q} \int \frac{x^{\frac{p}{q}} \dot{x}}{m \pm x}; \text{ and the sum of } n \text{ terms,}$$

$$\Sigma = \frac{1}{q} \int \frac{(m^n - x^n) x^{\frac{p}{q}} \dot{x}}{m^n(m-x)}, \text{ when the signs are all plus;}$$

$$\text{and } \Sigma = \frac{1}{q} \int \frac{(m^{2n} - x^{2n}) x^{\frac{p}{q}} \dot{x}}{m^{2n}(m+x)}, \text{ when alternately plus}$$

and minus.

For a farther illustration of this method, we refer the reader to Clarke's translation of Lorgna's treatise, "*De Seriebus Convergentibus*," 4to. 1779.

11. *Circular Series.*—We have stated, when illustrating the methods of summation employed by the Bernoullis, that James, although he had discovered several curious properties of the series,

$$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \&c.$$

had not been able to find its sum; but this his brother John afterwards effected, and the solution of it is published in the 4th volume of his "*Opera Omnia*." Bernoulli found this sum to depend upon the rectification of the circle, shewing that it is equal to one-sixth of the square of the semi-circumference of a circle, whose radius = 1. This result he drew from the known series, which expresses the sine of an arc in terms of the arc, viz.

$$\sin. x = x - \frac{x^3}{2 \cdot 3} + \frac{x^5}{2 \cdot 3 \cdot 4 \cdot 5} - \frac{x^7}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7} + \&c.;$$

which, when $\sin. x = 0$, becomes, after dividing by x ,

$$0 = 1 - \frac{1}{2 \cdot 3} x^2 + \frac{1}{2 \cdot 3 \cdot 4 \cdot 5} x^4 - \frac{1}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7} x^6 + \&c.$$

$$\text{Or writing } x = \frac{1}{z};$$

$$0 = 1 - \frac{1}{2 \cdot 3 z^2} + \frac{1}{2 \cdot 3 \cdot 4 \cdot 5 z^4} - \frac{1}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 z^6} + \&c.$$

Again, multiplying by z^{2n} ,

$$0 = z^{2n} - \frac{1}{2 \cdot 3} z^{2n-2} + \frac{1}{2 \cdot 3 \cdot 4 \cdot 5} z^{2n-4} - \&c.$$

Now the sum of the roots of every equation of this form

being equal to the co-efficient of the second term with its sign changed, we have

$$z^{1/2} + z^{1/2} + z^{1/2} + \&c.,$$

$$\text{or } \frac{1}{z^{1/2}} + \frac{1}{z^{1/2}} + \frac{1}{z^{1/2}} + \&c. = \frac{1}{6};$$

denoting by $z^{1/2}$, $z^{1/2}$, $z^{1/2}$, &c., or $\frac{1}{z^{1/2}}$, $\frac{1}{z^{1/2}}$, $\frac{1}{z^{1/2}}$, &c. the

successive roots of the above equation.

But we know that the values of x , answering to the case of $\sin. x = 0$, are π , 2π , 3π , 4π , &c.; π denoting the semi-circumference: substituting, therefore, these successive values of x , we have

$$\frac{1}{\pi^2} + \frac{1}{2^2 \pi^2} + \frac{1}{4^2 \pi^2} + \frac{1}{3^2 \pi^2} + \frac{1}{4^2 \pi^2} + \&c. = \frac{1}{6},$$

$$\text{or } \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \&c. = \frac{\pi^2}{6}.$$

Landen's method depends upon exactly the same principles; but he has rendered it more general, and exhibits several very remarkable series of this kind. He first deduces the formulæ for expressing the sums of the several powers of the roots, a , b , c , &c. of any equation

$$x^n + A x^{n-1} + B x^{n-2} + C x^{n-3} + \&c. = 0;$$

$$\text{viz. if } S' = a + b + c + \&c.$$

$$S'' = a^2 + b^2 + c^2 + \&c.$$

$$S''' = a^3 + b^3 + c^3 + \&c.$$

$$\text{then } S' = -A$$

$$S'' = -2B - A S'$$

$$S''' = -3C - B S' - A S''$$

$$S'''' = -4D - C S' - B S'' - A S'''$$

$$\&c. \quad \&c.$$

Then from the two series for the sine and cosine of any arc x , viz.

$$\sin. x = x - \frac{x^3}{2 \cdot 3} + \frac{x^5}{2 \cdot 3 \cdot 4 \cdot 5} - \frac{x^7}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7} + \&c.$$

$$\cos. x = 1 - \frac{x^2}{2} + \frac{x^4}{2 \cdot 3 \cdot 4} - \frac{x^6}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6} + \&c.$$

he derives the sum of their roots, when $\sin. x = 0$, and $\cos. x = 0$; and then, from the preceding formula for the sums of the squares, cubes, &c. of the roots of an equation, draws the values of the several powers of those quantities.

Thus in the series for the cosine, when $\cos. x = 0$, we have for the several roots, (denoting the quadrant or $\frac{\pi}{2}$ by ϕ),

$$\left. \begin{aligned} &\frac{1}{\phi} + \frac{1}{3\phi} + \frac{1}{5\phi} + \frac{1}{7\phi} \\ &-\frac{1}{\phi} - \frac{1}{3\phi} - \frac{1}{5\phi} - \frac{1}{7\phi} \end{aligned} \right\} = 0;$$

there being no second term, but the sum of these squared, viz.

$$\left. \begin{aligned} &\frac{1}{\phi^2} + \frac{1}{3^2 \phi^2} + \frac{1}{5^2 \phi^2} + \frac{1}{7^2 \phi^2} \\ &\frac{1}{\phi^2} + \frac{1}{3^2 \phi^2} + \frac{1}{5^2 \phi^2} + \frac{1}{7^2 \phi^2} \end{aligned} \right\} =$$

$$\frac{2}{\phi} + \frac{2}{2^2 \phi^2} + \frac{2}{5^2 \phi^2} + \frac{2}{7^2 \phi^2} = S'' = \frac{1}{6^2} =$$

$$1 \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} = \frac{\phi^2}{2}.$$

In a similar manner we have

$$\frac{1}{1^4} + \frac{1}{3^4} + \frac{1}{5^4} + \frac{1}{7^4} + \&c. \frac{\phi^4}{6^4},$$

and on the same principle, the sum of the series,

$$1 + \frac{1}{3^{2n}} + \frac{1}{5^{2n}} + \frac{1}{7^{2n}} + \&c.$$

may be found, n being any positive number whatever.

Euler's method is still more general than Landen's, but it depends upon principles of very nearly the same origin: we must, however, limit ourselves to giving a few of the principal results. Representing by π the semi-circumference to radius 1, he shews that

$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \&c. = \frac{2^0}{1 \cdot 2 \cdot 3} \cdot \frac{1}{1} \pi^2$$

$$1 + \frac{1}{2^4} + \frac{1}{3^4} + \frac{1}{4^4} + \&c. = \frac{2^2}{1 \cdot 2 \cdot 3 \dots 5} \cdot \frac{1}{3} \pi^4$$

$$1 + \frac{1}{2^6} + \frac{1}{3^6} + \frac{1}{4^6} + \&c. = \frac{2^4}{1 \cdot 2 \cdot 3 \dots 7} \cdot \frac{1}{3} \pi^6$$

$$\&c. \quad \&c. = \&c.$$

where the law of the first multiplier is obvious, but the coefficients of π^2 , π^4 , &c. are not so easily seen: those for the

following powers are $\frac{3}{5} \pi^8$, $\frac{5}{3} \pi^{10}$, $\frac{691}{105} \pi^{12}$, &c.

If each of these series be multiplied by their first fraction, they give

$$\frac{1}{2^2} + \frac{1}{4^2} + \frac{1}{6^2} + \&c. = \frac{1}{2^2} \cdot \frac{2^0}{1 \cdot 2 \cdot 3} \cdot \frac{1}{1} \pi^2$$

$$\frac{1}{2^4} + \frac{1}{4^4} + \frac{1}{6^4} + \&c. = \frac{1}{2^4} \cdot \frac{2^2}{1 \cdot 2 \dots 5} \cdot \frac{1}{3} \pi^4$$

$$\&c. \quad \&c. = \&c.$$

and subtracting these from the first, we have

$$1 + \frac{1}{3^2} + \frac{1}{5^2} + \&c. = \frac{2^2 - 1}{2^2} \cdot \frac{2^0}{1 \cdot 2 \cdot 3} \cdot \frac{1}{1} \pi^2$$

$$1 + \frac{1}{3^4} + \frac{1}{5^4} + \&c. = \frac{2^4 - 1}{2^4} \cdot \frac{2^2}{1 \cdot 2 \dots 5} \cdot \frac{1}{3} \pi^4$$

$$\&c. \quad \&c. = \&c.$$

Again, subtracting the first from these last, we find the sum of the powers under the alternate signs plus and minus, and so on, almost in endless variety.

Other series, whose sums are found in nearly the same manner, are as follows, viz.

$$1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \&c. = \frac{\pi}{4}$$

$$1 + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \&c. = \frac{\pi^2}{8}$$

$$1 - \frac{1}{3^3} + \frac{1}{5^3} - \frac{1}{7^3} + \&c. = \frac{\pi^3}{32}$$

$$1 + \frac{1}{3^4} + \frac{1}{5^4} + \frac{1}{7^4} + \&c. = \frac{\pi^4}{96}$$

$$\&c. \quad \&c. = \&c.$$

For a great variety of other series of this kind, see Euler's "Introductio in Analysin Infinitorum," and his "Institutiones Calculi Differentialis." See also Spence's "Essay on the Theory of the various Orders of Logarithmic Transcendents," 4to. 1809; in which several series, somewhat similar to the above, but which were not summable by Euler's method, are treated of, and investigated in a very able manner.

We ought perhaps to apologize to such of our readers who are not interested in mathematical enquiries, for the length to which we have extended this article; but those who are, will not, we presume, be displeased to find in a condensed form a general view of the first introduction, and successive improvements, which have been made in this important branch of analysis. We have, of course, been obliged to pass over in silence many authors who have written on this subject; but we have endeavoured to include all those who have introduced into the doctrine any methods distinctly different from those who preceded them, at least, if we except Mr. Spence's method, published in his "Logarithmic Transcendents," and that of M. Arbogast, given in his "Calcul des Derivations." We had indeed, in the first instance, intended to give an illustration of the principles of these two authors; but the length to which the article has already extended, and the nature of their notation, which render necessary a considerable degree of previous explanation, put it out of our power to execute this part of our plan, and we can therefore do nothing more than refer the reader for information to the works themselves; we refer him also to the "Calcul des Differences Finies," by La Croix, and to an ingenious memoir by professor Vince, in the 72d volume of the Philosophical Transactions.

As the preceding article is arranged wholly with reference to the historical order of the subject, we intend, in conclusion, to furnish the reader with a general synopsis of the doctrine of series for the advantages of practical operations.

12. *General Synopsis for the Summation of Series.*—In the following tablet, S denotes the sum of a finite number of terms (n), and Σ the sum of an infinite number.

1. To find whether the sum of any proposed series be finite or infinite; let p, q, r , be any three equidistant terms; then, if $p(q-r) > r(p-q)$, the sum is finite; but if $p(q-r) < r(p-q)$, it is infinite.

2. The general term of a series, when any order m of its differences vanish, is of the form,

$$T = A n^m + B n^{m-1} + C n^{m-2} + \&c.$$

and its sum of the form,

$$\Sigma = A' n^{m+1} + B' n^m + C' n^{m-1} + \&c.$$

the values A, B, C , &c. being found as stated in art. 5, and those of A', B', C' , &c. in a similar manner.

3. *Simple arithmetical Series.*

$$a + (a+d) + (a+2d) + (a+3d) \dots a + (n-1)d$$

$$(\Sigma) \text{ Infinite } (S) = \frac{n}{2} (2a + (n-1)d).$$

If the series decrease, then d is negative, and

$$(S) = \frac{n}{2} (2a - (n-1)d).$$

4. *Simple geometrical Series.*

$$a + ra + r^2a + r^3a \dots r^{n-1}a$$

$$(\Sigma) = \frac{a}{1-r} \cdot (S) = \frac{r^n - 1}{r - 1} a$$

5. *Powers*

SERIES.

5. Powers of Arithmeticals.

$$\begin{aligned}
 & (m+p)^r + (m+2p)^r + (m+3p)^r + \dots + (m+np)^r \\
 (S) = & \frac{n^{r+1}}{(r+1)p} + \frac{n^r}{2} + \frac{p r n^{r-1}}{3 \cdot 4} - \frac{r(r-1)(r-2)}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6} p^2 n^{r-3} \\
 & + \frac{1}{6} \frac{r(r-1)(r-2)(r-3)(r-4)}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7} p^3 n^{r-5} - \frac{1}{30} \frac{r(r-1)(r-2) \dots (r-6)}{2 \cdot 3 \dots 8} p^4 n^{r-7} \\
 & + \frac{1}{42} \frac{r(r-1)(r-2) \dots (r-8)}{2 \cdot 3 \dots 9} p^5 n^{r-9} - \&c. \\
 & - \frac{m^{r+1}}{(r+1)p} - \frac{m^r}{2} - \frac{r p m^{r-1}}{3 \cdot 4} + \frac{r(r-1)(r-2)}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6} p^2 m^{r-3} - \&c.
 \end{aligned}$$

continued till they terminate. The co-efficients are the same as $\frac{1}{A}$, $\frac{1}{B}$, &c. N^o 11.

This form includes all the powers of the natural series, of which we have given the particular forms to the fifth power, under art. 3.

6. Series of figurate Numbers.

$$\begin{aligned}
 & 1 + m + \frac{m(m+1)}{1 \cdot 2} + \frac{m(m+1)(m+2)}{1 \cdot 2 \cdot 3} + \frac{m(m+1)(m+2)(m+3)}{1 \cdot 2 \cdot 3 \cdot 4} + \&c. \\
 (S) = & \frac{n(n+1)(n+2)(n+3)}{1 \cdot 2 \cdot 3 \cdot 4} \text{ to } m \text{ terms,} \\
 & \text{to } m \text{ terms.}
 \end{aligned}$$

See particular results, art. 3.

7. Series of compound Arithmeticals.

$$\begin{aligned}
 & (m+e)(p+e) + (m+2e)(p+2e) + \dots + (m+ne)(p+ne) \\
 (S) = & nmp + \frac{n+1}{2} (m+p)e + \frac{(n+1)(2n+1)}{6} e^2
 \end{aligned}$$

8. Series of compound geometrical Numbers.

$$\begin{aligned}
 & (b-m)(c-p)e^q + (b-2m)(c-2p)e^{q+r} + (b-3m)(c-3p)e^{q+2r} + \&c. \\
 (\Sigma) = & \frac{e^q}{1-e^r} \left\{ be - \frac{bp+cm}{1-e^r} + \frac{mp(1+e^r)}{(1-e^r)^2} \right\} \\
 (S) = (\Sigma) - & \frac{e^{q+rn}}{1-e^r} \left\{ (b-mn)(c-pn) - \frac{(b-mn)n + (c-pn)m}{1-e^r} + \frac{mp(1+e^r)}{(1-e^r)^2} \right\}
 \end{aligned}$$

9. Series of compound figurate Numbers.

$$\begin{aligned}
 & 1 + mn + \frac{m(m+1)}{1 \cdot 2} x^2 + \frac{m(m+1)(m+2)}{1 \cdot 2 \cdot 3} x^3 + \frac{m(m+1)(m+2)(m+3)}{1 \cdot 2 \cdot 3 \cdot 4} + \&c. \\
 (\Sigma) = & \frac{1}{(1-x)^m}
 \end{aligned}$$

10. Series of the Reciprocals of figurate Numbers.

$$\begin{aligned}
 & 1 + \frac{1}{m} + \frac{1 \cdot 2}{m(m+1)} + \frac{1 \cdot 2 \cdot 3}{m(m+1)(m+2)} + \frac{1 \cdot 2 \cdot 3 \cdot 4}{m(m+1)(m+2)(m+3)} + \&c. \\
 (\Sigma) = & \frac{m-1}{m-2}
 \end{aligned}$$

11. Reciprocals of the Powers of Arithmeticals.

$$\begin{aligned}
 & \frac{1}{a^m} + \frac{1}{(a \pm d)^m} + \frac{1}{(a \pm 2d)^m} + \frac{1}{(a \pm 3d)^m} + \dots + \frac{1}{(a \pm (n-1)d)^m} \\
 (S) = & \frac{p^{m-1} \circ 1}{(m-1)a^{m-1}d} - \frac{p^m \circ 1}{2a^m} + \frac{(p^{m+1} \circ 1)md}{2 \cdot A \cdot a^{m+1}} - \frac{(p^{m+3} \circ 1)m(m+1)(m+2)d^3}{2 \cdot 3 \cdot 4 \dots B a^{m+3}} \\
 & + \frac{(p^{m+5} \circ 1)m(m+1)(m+2) \dots (m+4)d^5}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \dots C a^{m+5}} - \&c.
 \end{aligned}$$

where

SERIES.

where the law of continuation is obvious, p being $= \frac{a}{a+n}$, and the values of $\frac{1}{A}$, $\frac{1}{B}$, $\frac{1}{C}$, &c. being derived as follows, viz. denoting these respectively by $\frac{1}{1\phi}$, $\frac{1}{3\phi}$, $\frac{1}{5\phi}$, &c.

$$\frac{1}{1\phi} = \frac{1}{6}$$

$$\frac{1}{3\phi} = \frac{3}{10} - 2 \cdot \frac{1}{1\phi}$$

$$\frac{1}{5\phi} = \frac{5}{14} - 3 \cdot \frac{1}{3\phi} + 5 \cdot \frac{1}{1\phi}$$

$$\frac{1}{7\phi} = \text{\&c. \&c. and generally}$$

$$\frac{1}{n\phi} = \frac{n}{2n+4} - \frac{n+1}{2} \cdot \frac{1}{1\phi} + \frac{(n+1)n(n-1)}{2 \cdot 3 \cdot 4} \cdot \frac{1}{3\phi} - \frac{(n+1)n(n-1)(n-2)(n-3)}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6} \cdot \frac{1}{5\phi} \text{\&c.}$$

12. Fractional Series of the following Form.

$$(1.) \quad \frac{m}{\beta} + \frac{m(m+p)}{\beta(\beta+p)} + \frac{m(m+p)(m+2p)}{\beta(\beta+p)(\beta+2p)} + \dots + \frac{m(m+p) \dots (m+(n-1)p)}{\beta(\beta+p) \dots (\beta+(n-1)p)}$$

$$(\Sigma) = \frac{m}{\beta-p-m}$$

$$(2.) \quad \frac{1}{(p+q)(m+r)} \pm \frac{1}{(p+2q)(m+2r)} + \frac{1}{(p+3q)(m+3r)} \pm \dots \pm \frac{1}{(p+nq)(m+nr)}$$

$$(\Sigma) = \frac{1}{pq\pi} \times \int \frac{(x^p - x^r) \dot{x}}{1+x}$$

$$(3.) \quad \frac{1}{(p+q)\beta} \pm \frac{1}{(p+2q)\beta^2} + \frac{1}{(p+3q)\beta^3} \pm \dots \pm \frac{1}{(p+nq)\beta^n}$$

$$(S) = \frac{1}{q} \int \frac{(\beta^n - x^n) x^p \dot{x}}{\beta^n (\beta+x)} \quad (\Sigma) = \frac{1}{q} \int \frac{x^p \dot{x}}{\beta+x}$$

where β must be affirmative, and not less than unity.

$$(4.) \quad \frac{a}{b(b+c)} + \frac{a}{(b+c)(b+2c)} + \frac{a}{(b+2c)(b+3c)} + \dots + \frac{a}{(b+(n+1)c)(b+nc)}$$

$$(S) = \frac{na}{b(b+nc)} \quad (\Sigma) = \frac{a}{bc}$$

$$(5.) \quad \frac{a}{b(b+c)(b+2c)} + \frac{a+e}{(b+c)(b+2c)(b+3c)} + \frac{a+2e}{(b+2c)(b+3c)(b+4c)}$$

$$+ \text{\&c.} \dots \frac{a+(n+1)e}{\{b+(n-1)c\}(b+nc)\{b+(n+1)c\}}$$

$$(S) = \frac{(2ab+ac-be)n + (ac+be)n^2}{2b(b+c)(b+nc)(b+(n+1)c)}$$

$$(6.) \quad \frac{a}{a+1} + \frac{a+b}{(a+1)(a+1+b)} + \frac{a+2b}{(a+1)(a+1+b)(a+1+2b)}$$

$$+ \text{\&c.} \dots \frac{a+(n-1)b}{(a+1)(a+1+b) \dots (a+1+(n-1)b)}$$

$$(S) = 1 - \frac{1}{(a+1)(a+1+b) \dots (a+1+(n-1)b)}$$

$$(7.) \quad a \cdot c + (a+b)cq + (a+2b)cq^2 + (a+3b)cq^3 + \text{\&c.}$$

$$(S) = \frac{ac(q^n-1) + nbcq^n}{q-1} - \frac{bcq(q^n-1)}{(q-1)^2}$$

$$(8.) \frac{a}{c} + \frac{a+b}{cq} + \frac{a+2b}{cq^2} + \frac{a+3b}{cq^3} + \&c.$$

$$(S) = \frac{\{a(q-1) + b\} (q^n - 1) - nb(q-1)}{cq^{n-1}(q-1)^2}$$

For a great variety of other fractional series, see Clarke's translation of Lorgna's Series; for the several differential formulæ, our articles 3, 6, 7, 8, and 9; for the summation of RECURRING Series, see that article; for the most useful logarithmic series, see LOGARITHMS; and for various trigonometrical series, see the articles SINES, and TRIGONOMETRY.

SERIGNAC, in *Geography*, a town of France, in the department of the Finistère; 10 miles N. of Carhaix.

SERIGNAN, a town of France, in the department of the Herault; 6 miles S. of Beziers.

SERIGNI, a sea-port town of the island of Java, in the straits of Sunda, belonging to the king of Bantam.

SERIGO. See CERIGO.

SERIGO, a town of Italy, on the lake Como; 27 miles N. of Como.

SERJIEYODOUC, a town of Chinese Tartary, in the country of the Monguls. N. lat. $42^{\circ} 15'$. E. long. $102^{\circ} 34'$.

SERIKOTCHE, a town of Persia, in the province of Chorasan or Khorassan; 195 miles N. of Herat.

SERIMSAH, a town of Egypt; 16 miles S. of Damietta.

SERIN, or SERAIN, a river of France, which runs into the Yonne, between Auxerre and Joigny.

SERIN, or *Serinus*, in *Ornithology*, the name of a small bird; a species of the Fringilla in the Linnæan system, common in Germany and Italy, and called by the Austrians *baerngril*, or *birngryl*. Its back is of a reddish-brown, and its head yellow; the colour being deeper in the male, and paler in the female; the rump is of a beautiful yellowish-green, as is also the breast; the belly is white, and the sides have some oblong blackish spots; the tail, and long feathers of the wings, are black, and a little greenish at their extremities; the beak is very thick, strong, and short, and is very sharp at the point. It is kept in cages, and sings very sweetly.

SERIN of Surinam. See PIPRA *Cristata*.

SERIN of the Canaries. See FRINGILLA *Canaria*.

SERIN of Jamaica. See FRINGILLA *Can.*

SERINDA, in *Ancient Geography*, a town of India, on this side of the Ganges, the inhabitants of which paid great respect to the emperor Julian.

SERINE, in *Geography*, a town of European Turkey, in the province of Macedonia; 44 miles S.E. of Saloniki.

SERINEAH, a town of Bengal, 18 miles S. of Purneah.

SERINETTE, a bird organ, said in the Encyclopédie to be an invention of Barbary. The pitch is very high, being in unison with the larigot stop in French organs, and with our 15th. It is used to teach birds little tunes, by those unable to play on the flageolet. Its compass is only an octave, or 13 pipes, as no base is ever wanted.

SERINGAPATAM, in *Geography*, a city of Hindoostan, and capital of Myfore, situated on an island in the Cauvery, which is here about five feet deep, and runs over a rocky channel, about 290 or 300 miles from Madras. The length of this isle is about four miles, and its breadth about four and a half miles; the western side being allotted to the fortrefs,

which occupied 2000 yards, distinguished by regular outworks, magnificent palaces, and lofty mosks; for Tippoo and his father were both Mahometans, nor were they averse from the persecution of the Hindoos and Christians. The environs were decorated with noble gardens; and among other means of defence was the "bound hedge," as it was called, consisting of every thorny tree and caustic plant of the climate, planted to the breadth of from 30 to 50 feet. Covered on the north and south by the river, this fortress was defended till the peace of 1792 by a single rampart; the east and west faces being much weaker, were strengthened by double walls and ditches, by outworks before the gates, by a circular work upon the south-east angle, and by several formidable cavaliers within and upon the southern rampart. The rampart, which is thick and strong, varies in height from 20 to 35 feet and upwards: the whole of the revêtement, except the north-west bastion, is composed of granite cut in large oblong pieces, laid in cement, transversely in the walls. The ditches are cut out of the solid rock; a stone glacis extends along the north face. But the interior of the fort has few good buildings, and the town in general is mean. The old Myfore palace being in a ruined state, has been converted into a military storehouse. The sultan's palace is a magnificent edifice, in the Asiatic style, but much disfigured by a high wall, and a number of unfinished buildings round it. The great mosk is covered with the finest chunam (or polished cement), and ornamented with lofty minarets. In the year 1792, lord Cornwallis laid siege to this city, and compelled Tippoo, king of Myfore, to a peace, by which he made a cession of great part of his dominions, and agreed to pay three crores and thirty lacks of rupees towards the expenses of the war. In the year 1799, the British troops, after a short siege of a few days, took it by assault. The loss of the besiegers amounted to 22 officers killed, and 45 wounded, 181 Europeans rank and file killed, 622 wounded, and 22 missing; 119 natives killed, 420 wounded, and 100 missing. There were in the fort 13,739 regular infantry; and without the fort and in the intrenchments of the island 8100. The loss must have been very great, as in the assault only, 24 principal officers were killed, and seven wounded, besides Tippoo himself, who received a shot in his head. There were found in the forts 373 brass guns, 60 mortars, 11 howitzers, 466 iron guns, and 12 mortars, 424,400 round shot, 520,000 lbs. of gunpowder, and 99,000 muskets, carbines, &c. Within the fort there were 11 large powder magazines, 72 expence magazines, 11 armouries, two cannon foundries, three buildings with magazines for boring guns and muskets, four large arsenals, and 17 other storehouses, containing accoutrements, swords, and other articles, besides many granaries abundantly stored with provisions of all kinds. Of treasure and jewels the total value was 2,535,804 star pagodas, or 1,143,216 sterling. The fall of this city put the whole kingdom of Myfore, with all its resources, into the power of the British government. Tippoo's sons surrendered on the fall of Seringapatam. When the strength of the fortifications of all kinds of this place, and the number of Tippoo's troops and artillery are considered, our repeated successes afford a convincing proof that no climate or fortrefs can overcome British courage, conduct, and perseverance. N. lat. $12^{\circ} 31' 45''$. E. long. $76^{\circ} 46' 45''$.

SERINGHAM, an island of Hindoostan, in the river Cauvery, on which are two pagodas, much venerated by the Hindoos, and one peculiarly the object of devotion. In 1751 the French took possession of this pagoda, and in the following year it was taken by the English under major Lawrence; 4 miles N.E. of Trichinopoly.

SERINHAEM, a river of Brasil, which runs into the Atlantic, S. lat. $12^{\circ} 50'$.

SERINO, a town of Naples, in Principato Ultra; 19 miles S. of Benevento.

SERINPALE, a town of Africa, in the country of Cayer, on the left bank of the Senegal. N. lat. $16^{\circ} 50'$. W. long. $15^{\circ} 50'$.

SERINPETA, an island in the river Senegal, where the canoes of the country are constructed.

SERIO, a river of Italy, which runs into the Adda, at Pizzighitone.—Also, a department of Italy, composed of part of the Bergamasco: it contains 195,803 inhabitants, who elect 15 deputies. Its capital is Bergamo.

SERIOLA, in *Botany*, said by De Theis to be the diminutive of *seris*, the ancient appellation of *Succory* or *Endive*, which this plant resembles, especially in its leaves.—Linn. Gen. 404. Schreb. 533. Willd. Sp. Pl. v. 3. 1619. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 4. 465. Juss. 171. Lamarck Illustr. t. 656. Gærtn. t. 159.—Class and order. *Syngenesia Polygamia Æqualis*. Nat. Ord. *Compositæ Semiflosculosæ*, Linn. *Cichoraceæ*, Juss.

Gen. Ch. Common calyx simple, composed of linear, nearly equal, erect leaves. Cor. compound, imbricated, uniform, composed of numerous, equal, perfect flowers; proper of one ligulate, linear, truncated, five-toothed petal. Stam. Filaments five, capillary, very short; anthers cylindrical, tubular. Pist. Germen ovate; style thread-shaped, the length of the stamens; stigmas two, reflexed. Peric. none, except the unchanged calyx. Seeds oblong, the length of the calyx. Down capillary, feathered, with ten rays hairy at the sides. Recept. chaffy, deciduous, as long as the calyx.

Eff. Ch. Receptacle chaffy. Calyx simple. Seed-down rather hairy.

1. *S. lavigata*. Smooth Seriola. Linn. Sp. Pl. 1139. Desfont. Atlant. v. 2. 237. t. 216.—Herb smoothish. Leaves obovate, toothed.—Found in the fissures of rocks in Barbary, and in the island of Candia. It flowers, as indeed do all the rest, in July and August. Roots perennial, long, twisted, scaly at the top. Stem none. Leaves radical, in a circular cluster, stalked, smooth, remotely toothed, decurrent. Flower-stalks erect, slender, a little streaked, slightly branched, sometimes simple, almost leafless, mostly single-flowered. Flowers yellow.

2. *S. æthnensis*. Rough Seriola. Linn. Sp. Pl. 1139. Desfont. Atlant. v. 2. 237. “Jacq. Obf. v. 4. 3. t. 79.”—Herb rough. Leaves obovate, slightly toothed.—Native of Italy, and near Mascar in Barbary. Root annual. Stems branched, erect, hairy. Leaves hairy, stalked; upper ones sessile, embracing the stem. Flower-stalks erect, hairy, leafless above, unequal, single-flowered. Flowers yellow, forming a sort of corymbose panicle.

3. *S. cretensis*. Cretan Seriola. Linn. Sp. Pl. 1139. (“*Achyrophorus hirsutus*, *dentis leonis folio leviter dentato*; Vaill. Act. 740.”)—Herb rough with hairs. Leaves runcinate.—Native of the island of Candia or Crete. We know not of any figure or description of this species. It rests on the above quoted authorities.

4. *S. urens*. Stinging Seriola. Linn. Sp. Pl. 1139. Allion. Pedem. t. 29. f. 1. “Schmidel. Ic. t. 32.”—Herb stinging. Leaves toothed. Stem branched.—Native of Sicily and the south of Europe. Root annual, small, fibrous. Stem none. Leaves in a circular cluster, hairy, fringed. Flower-stalks erect, hairy, slightly branched. Flowers yellow. Linnæus discovered that the scales of the calyx are sharp with pungent little prickles, whence indeed the specific name.

Vol. XXXII.

SERIPALA, in *Ancient Geography*, a town of India, on this side of the Ganges, in the number of those which were situated to the east of the river Nomadus, according to Ptolemy.

SERIPHIMUM, in *Botany*, a name applied to this genus on account of the analogy, in its habit and foliage, with *Artemisia pontica* of Pliny, called by the Greeks Σερίφιον. The origin of this name may be traced to *Seriphion*, or, as it is now called, *Serpho*, an island in the Ægean sea, whose soil is of so dry and sterile a nature, as only to abound in plants of this rough kind. “This island,” says De Theis, “covered with rocks and mountains, has always been regarded as a melancholy retreat. A Greek once demanded of one of its inhabitants, what crime they punished with banishment? Perjury, was the answer. Why then, says the Greek, don’t you always perjure yourselves, in order that you may escape from such a horrible residence?” The French name *Armoïelle*, from *Armoise*, Wormwood, is expressive of its natural affinity to that genus.—Linn. Gen. 454. Schreb. 594. Mart. Mill. Dict. v. 4. Juss. 180. Lamarck Illustr. t. 722. Gærtn. t. 167.—Class and order, *Syngenesia Polygamia Segregata*. Nat. Ord. *Compositæ Nucamentaceæ*, Linn. *Corymbifera*, Juss.

Obf. Willdenow and the editor of *Hortus Kewensis* have not adopted this genus. They refer the several species of it to *Artemisia* and *Stæbe*.

Gen. Ch. Cal. Perianth double; outer of five, roundish, imbricated, downy leaves; inner of five, erect, acuminate, awl-shaped, smooth, scaly leaves, which are twice as long as the outer ones, single-flowered. Cor. of one petal, funnel-shaped, shorter than the inner calyx; limb five-toothed. Stam. Filaments five, capillary; anthers cylindrical. Pist. Germen between the calyx and the flower; style thread-shaped; stigma rather cloven. Peric. none, except the unchanged, closed calyx. Seed solitary, oblong.

Eff. Ch. Calyx double, imbricated. Corolla of one petal, regular. Seed solitary, oblong, below the corolla.

1. *S. cinereum*. Heath-leaved Seriphium. Linn. Sp. Pl. 1316. (Stæbe cinerea; Willd. Sp. Pl. v. 3. 2406. *Tamariscus æthiopicus*, *Coridis folio glabro*; Pluk. Mant. 178. t. 297. f. 1.)—Flowers in whorled spikes. Leaves spreading.—Native of the Cape of Good Hope, as indeed are all the remaining species. They flower from July to September. Stem upright, branched. Leaves spreading, small, lanceolate, crowded, recurved, gibbous at the base, hoary. Flowers in lengthened spikes, like a fox’s tail, pale red, interrupted. Scales of the calyx almost brittle.

2. *S. plumosum*. Feathered Seriphium. Linn. Sp. Pl. 1316. Mant. 481. (Stæbe plumosa; Willd. Sp. Pl. v. 3. 2407.)—Flowers about six in a whorl, spiked. Leaves clustered, awl-shaped.—Leaves thread-shaped, granulated. Flowers lateral, sessile, imbricated.

3. *S. fuscum*. Brown Seriphium. Linn. Sp. Pl. 1317. Mant. 481. (Stæbe fusca; Willd. Sp. Pl. v. 3. 2407.)—Flowers in terminal heads. Leaves linear, awnless, downy. Stems branched, wavy. Leaves ash-coloured. Flowers sessile, terminal, clustered.

4. *S. ambiguum*. Doubtful Seriphium. Linn. Sytt. Veg. ed. 14. 799. (*Artemisia ambigua*; Linn. Sp. Pl. 1190. Willd. Sp. Pl. v. 3. 1815.)—Flowers about three together, spiked. Leaves linear. Stem shrubby, procumbent, branched, ash-coloured. Leaves simple, linear, clustered. Flowers in long, terminal spikes.

The seed-down of this species being feathered at the tip, induced Linnæus to make it a *Seriphium*.

SERIPHUS, or SERIPHOS, in *Ancient Geography*, an island in the Archipelago, and one of the Cyclades, according

cording to Herodotus, the inhabitants of which took the part of the Greeks against Xerxes. Some authors, however, place Seriphus in the rank of the Sporades. It is situated west of Paros, and south of Cythnus. It presents the appearance of a rock, but is inhabited. The Romans sent thither certain criminals.

SERIPPO, a town of Hispania, in Bætica. Pliny.

SERI SOMTOU, in *Geography*, a district of Thibet, situated between E. long. 95° and 96°, and between N. lat. 30° and 31°.

SERISSA, in *Botany*, a genus of Jussieu's, and by that author correctly separated from *Lycium*. Loureiro calls it *Dysoda*, from *δυσωδης*, *sinking*, because of its remarkably fetid smell.—Juss. Gen. 209. Willd. Sp. Pl. v. 1. 1061. Ait. Hort. Kew. v. 1. 376. Lamarck Illustr. t. 151. (*Dysoda*; Loureir. Cochinch. 145. Buchozia; L'Herit. Monogr.)—Class and order, *Pentandria Monogynia*. Nat. Ord. *Rubiaceae*, Juss.

Gen. Ch. Cal. Perianth superior, divided into five, awl-shaped, erect segments. Cor. of one petal, funnel-shaped; tube short; limb broad, reflexed, five-cleft; segments trifid, acute. Stam. Filaments five, very short, below the mouth of the tube; anthers oblong, incumbent. Pist. Germen inferior, roundish; style thread-shaped, the length of the corolla; stigma oblong, villous, cloven, reflexed. Peric. Berry roundish, small, of one cell. Seeds numerous, (according to L'Heritier and Brown only two,) ovate, small.

Eff. Ch. Corolla funnel-shaped, fringed at the mouth. Segments of the limb mostly three-lobed. Berry inferior, with two seeds.

1. *S. fetida*. Japanese Seriffa. Willd. n. 1. Ait. Hort. Kew. v. 1. 376. (*Lycium japonicum*; Curt. Mag. t. 361.)—Native of China and Japan, flowering throughout the summer.—Stem shrubby, much divided, about two feet high, erect. Branches ascending. Leaves sessile, oblong, ovate, entire, flat, small, clustered together. Flowers solitary or clustered, generally terminal, white.

This elegant little shrub produces numerous white flowers, which have the appearance of those of Jasmine, but are without scent, as indeed is the whole plant, until it be squeezed or bruised, when it emits a highly disgusting smell. A variety with double flowers is not uncommon in the gardens about London.

SERIUM, in *Ancient Geography*, a town of European Sarmatia, in the vicinity of the Borysthenes. Ptolemy.

SERKA, in *Geography*, a town of Nubia; 200 miles S. of Sennaar.

SERKEISK, a town of Russia, in the government of Kaluga; 44 miles W.S.W. of Kaluga. N. lat. 54° 16'. E. long. 34° 34'.

SERKES. See TSERKESH.

SERKIS, a town of Asiatic Turkey, in Caramania; 50 miles W. of Cogni.

SERLIO, SEBASTIANO, in *Biography*, an eminent architect, was a native of Bologna, who flourished in the early part of the sixteenth century at Venice, in the character of an architect. He afterwards travelled through Italy, and resided a considerable time at Rome, where he studied the fine arts, and made many drawings of edifices, ancient and modern, and he is said to have been the first who examined, with the eye of a man of science, the remains of ancient architecture. The knowledge which he acquired was given to the public in a complete treatise of architecture, of which he planned several books, and the first that appeared was the fourth in order, comprehending the general rules of architecture, which he printed at Venice in

1537, dedicated to Hercules II. duke of Ferrara. The other six books appeared successively at different intervals, and the different editions made of them prove their popularity. Serlio, in 1541, was invited to France by Francis I. and was by that sovereign employed in the erections at Fontainebleau, where he thenceforth resided, and where he died, at an advanced age, in 1578. Though as an author he was much attached to the principles of Vitruvius in his designs as an artist, he very much neglected them. His school of St. Roch, and palace Grimani at Venice, are built in a grand and magnificent style. Gen. Biog.

SERMAISE, in *Geography*, a town of France, in the department of the Marne; 19 miles S. of Menehould.

SERMAISES, a town of France, in the department of the Loiret; 7 miles N. of Pithiviers.

SERMAKI, a town of Sweden, in the province of Tavastland; 170 miles N. of Tavasthus.

SERMANICOMAGUS, in *Ancient Geography*, a town of Gaul, which, according to the tables of Peutinger, was situated in Aquitania secunda. It was on the right of the Charente, at some distance N. of Iculifna, according to M. d'Anville; it is the present Chermes.

SERMATIA, in *Geography*, a town of Hindooistan, in the subah of Agra; 25 miles N.E. of Kerowly.

SERMATTA, an island in the East Indian sea, about 22 miles long, and six broad. S. lat. 8° 9'. E. long. 129° 13'.

SERMESOK, an island near the W. coast of Greenland. N. lat. 61° 50'. W. long. 47° 45'.

SERMIA, a river which rises near Montegio, in the state of Genoa, and after passing by Serravalle, Tortona, &c. runs into the Tanaro.

SERMIN, a town of Istria; 2 miles N.E. of Capo d'Istria.

SERMIONE, a town and castle of Italy, in the Veronese, on a neck of land running into lake Garda, the harbour of which may be shut by means of chains, defended by a castle. This was the native place of the poet Catullus; 16 miles W. of Verona.

SERMOCINATION, SERMOCINATIO, in *Rhetoric*, denotes discourse in general, whether held by a person alone, or in company, and is the same with what is otherwise called dialogism.

SERMOLOGUS, SERMOLOGUE, an ecclesiastical book composed of sermons, or homilies of popes, and other persons of eminence and sanctity, formerly read at the feasts of the Confessors, the Purification, All Saints, and on every day from Christmas to the octave of the Epiphany. See HOMILY.

SERMON, a discourse delivered in public, for the purpose of religious instruction and improvement: or a persuasive oration.

As to the choice of subjects for a sermon, they should be such as in the judgment of the preacher seem to be the most useful, and the best accommodated to the circumstances of his audience. The unmeaning applause which the ignorant give to what is above their capacity, common sense and common probity must teach every man to despise. Usefulness and true eloquence are inseparable, nor can any man be justly deemed a good preacher, who is not an useful one. In a sermon, considered as a peculiar species of composition, the first object of attention is its unity; by which we mean, that there should be some one main point, to which the whole strain of a sermon should refer. This unity, however, does not require that there should be no separate heads or divisions in the discourse, or that one thought should again and again be presented to the hearer in different lights. Separate divisions or distinct heads, provided that they are not too numerous

SERMON.

numerous and too minute, serve to aid the composer and the hearer of a sermon. In order to render sermons more striking, and consequently more useful, the subject of them should be precise and particular. General subjects, though often chosen by young preachers, because they offer a more ample supply of matter, without much labour of thought, and a wider scope for the display of showy talents, are by no means the most favourable for producing the high effects of preaching. These subjects, often resorted to, admit of little diversity and variety. The attention of the hearer is more certainly engaged and fixed, by seizing some particular view of a great subject, some single interesting topic, and directing to that point the whole force of argument and eloquence. Here indeed the execution is more difficult, but the merit and the effect are higher. Moreover, the composer of a sermon should never study to say all that can be said upon a subject: no error can be greater than this. On the other hand, the preacher should select the most useful, striking, and persuasive topics which the text suggests; and with this view he should consider, that discourses for the pulpit are intended less for information than persuasion, and that nothing is more opposite to persuasion than an unnecessary and tedious fulness. Again, in studying a sermon, the preacher ought to place himself in the situation of a serious hearer; and derive his principal materials from those views of a subject, and those arguments and reflections which would operate most favourably and most effectually on his own mind. Above all things, the preacher should study to render his instructions interesting to the hearers. In this respect, much depends on the delivery of a discourse, but much will also depend on the composition of it. Correct language and elegant description are but the secondary instruments of preaching in an interesting manner. The great secret lies, in bringing home all that is said to the hearts of the hearers, so that every man may be led to think that the preacher is addressing him in particular. It is hardly necessary to subjoin a caution here, that personality should be avoided. For the attainment of the end now stated, the preacher should avoid all intricate reasonings, and expressing himself in general speculative propositions, or laying down practical truths in an abstract metaphysical manner. As much as possible, the discourse ought to be carried on in the strain of direct address to the audience; not in the strain of one writing an essay, but of one speaking to a multitude, and studying to mix what is called application, or what has an immediate reference to practice, with the doctrinal and didactic parts of the sermon. In this connection we may add, that the preacher should adapt his discourses, with a view of making them interesting, to the different ages, characters, and conditions of men, and that he should avail himself of any personal or domestic occurrence, for imparting either instruction or consolation. Some of the most impressive discourses are those that delineate and exhibit examples founded on historical facts, and drawn from real life. Many of these may be found in scripture, which, when they are well chosen, command a high degree of attention. Bishop Butler's sermon on the "character of Balaam," affords a specimen of this kind of preaching. It is of importance to observe, farther, that the preacher should be cautious not to take his model from particular fashions that chance to have the vogue. It is the universal taste of mankind, which is subject to no changing modes, that alone is entitled to possess any authority: and this will never give its sanction to any strain of preaching that is not founded in human nature, connected with usefulness, adapted to the proper idea of a sermon, as a serious persuasive oration, delivered to a multitude, in order to make them better men. Let the preacher form himself upon this

standard, and he will attain reputation and success much more than by a servile compliance with any popular taste, or transient humour of his hearers.

As to the style of sermons, it should in the first place be very perspicuous. Plainness and simplicity should prevail; and of course all unusual, swollen, or high-sounding words should be avoided; and especially those that are merely poetical, or merely philosophical. Dignity of expression is indeed indispensable; but this dignity is perfectly consistent with simplicity, and also with a lively and animated style, dictated by the earnestness which a preacher ought really to feel, and not merely to affect, and justified by the grandeur and importance of his subjects. He not only may employ metaphors and comparisons, but, on proper occasions, may apostrophise the sinner or the sinner, may personify inanimate objects, break out into bold exclamations, and, in general, command the most passionate figures of speech.

The language of scripture, properly employed, is a great ornament to sermons; and it may be employed either in the way of quotation or allusion. But the allusions which the preacher uses should be natural and easy, for if they seem forced, they approach to the nature of conceits. In a sermon, no points or conceits should appear, no affected smartness and quaintness of expression; which derogate much from the dignity of the pulpit. It is a strong expressive style, rather than a sparkling one, that ought to be studied. Epithets have often great beauty and force, but it is a great error to imagine, that we render style strong and expressive, by a constant and multiplied use of epithets.

As to the question, whether it be most proper to write sermons fully, and commit them accurately to memory, or to study only the matter and thoughts, and trust the expression, in part at least, to the delivery, Dr. Blair is of opinion that no universal rule can be given. Preachers must adopt either of these methods, according to their different genius, and we may add according to the situation where they are settled, and the rank or character of the assembly which they address. It is proper, however, to begin, at least, the practice of preaching, with writing as accurately as possible. He thinks it also proper to continue, as long as the habits of industry last, in the practice both of writing and committing to memory. The practice of reading sermons is, as our author says, one of the greatest obstacles to the eloquence of the pulpit in Great Britain, where alone this practice prevails. No discourse which is designed to be persuasive can have the same force when read as when spoken. We are of opinion, however, that sermons from memory have little advantage, in point of effect, above those that are read. An extemporary sermon has this advantage in an eminent degree; but few excel, and many discourses of this kind are such as would disfigure a judicious, though candid, hearer.

The French and English writers of sermons proceed upon very different ideas of the eloquence of the pulpit. A French sermon is, for the most part, a warm animated exhortation; an English one, a piece of cool instructive reasoning. The French preachers address themselves chiefly to the imagination and the passions: the English, almost solely to the understanding. The union of these two kinds of composition, of the French earnestness and warmth with the English accuracy and reasoning, would form, in Dr. Blair's judgment, the model of a perfect sermon. The censure which, in fact, the French critics pass on the English preachers is, that they are philosophers and logicians, but not orators. Among the French Protestant divines, Saurin is the most distinguished; and the late Mr. Robinson of Cambridge has done a public service by translating many of his discourses into the English language.

Saurin is copious, eloquent, and devout, though, in his manner, too ostentatious. Among the Roman Catholics, the two most eminent are Bourdaloue and Massillon. The French critics differ in their opinion to which of these preachers the preference is due. To Bourdaloue they attribute more solidity and close reasoning: to Massillon, a more pleasing and engaging manner. The former is a great reasoner, and inculcates his doctrines with much zeal, piety, and earnestness; but his style is verbose, and abounding with quotations from the fathers, and he wants imagination. Massillon has more grace, more sentiment, and, as Dr. Blair thinks, may have more genius. He discovers much knowledge, both of the world and of the human heart; he is pathetic and persuasive, and is perhaps the most eloquent writer of sermons which modern times have produced. During the period that preceded the restoration of Charles II., the sermons of the English divines abounded with scholastic casuistical theology, but in their application they adopted more pathetic addresses to the consciences of the hearers. Upon the restoration, preaching assumed a more correct and polished form. Whatever was earnest and passionate, either in the composition or delivery of sermons, was reckoned enthusiastic and fanatical; and hence that argumentative manner, bordering on the dry and unperceptive, which is too generally the character of English sermons. Dr. Clark, who excels in a variety of respects, may be esteemed a very instructive composer of sermons, but he is deficient in the power of interesting and seizing the heart. Tillotson's manner is more free and warm, and he approaches nearer than most of the English divines to the character of popular speaking; and he is, even now, one of the best models for preaching. Dr. Barrow is admirable for the prodigious fecundity of his invention, and the concurrence, strength, and force of his conceptions; but less happy in execution, or composition. Atterbury deserves to be particularly mentioned as a model of correct and beautiful style, besides having the merit of a warmer and more eloquent strain of writing in some of his sermons, than is commonly met with. If Buller had given us more sermons in the strain of those upon self-deceit and the character of Balaam, in the room of abstract philosophical essays, he might have been distinguished for that species of characteristical sermons above recommended.

The parts of a sermon, discourse, or regular formed oration, are the following six; viz. the exordium or introduction, the state and division of the subject, narration, and explication, reasoning, or arguments, the pathetic part, and the conclusion. (See each under its proper head.) The introduction of an English sermon is too often stiff and formal, whereas those of the French preachers are very splendid and lively. Common-place topics should be avoided; variety should be studied; and in some cases the discourse may commence without an introduction. Explanatory introductions from the context are not uncommon, they are appropriate and instructive; but they should not be too long. An historical introduction has, generally, a happy effect in causing attention. To the proposition or enunciation of the subject generally succeeds the division; but it has been questioned, whether this method of laying down heads, as it is called, be the best method of preaching. Archbishop Cambray declares strongly against it; alleging, that it is a modern invention, that it was never practised by the fathers of the church, and that it took its rise from the schoolmen. But we are of opinion, with Dr. Blair, that it serves useful purposes, and ought not to be laid aside. (See the preceding part of this article.) But in any discourse or sermon, there are certain rules which should be observed, e. g. the several parts into which the subject is divided should be really dis-

tinct from one another: the order of nature should be followed, beginning with the simplest points, or those that are most easily apprehended and necessary to be first discussed, and then proceeding to those which are built upon the former, and which suppose them to be known:—the several members of a division ought to exhaust the subject:—the terms in which the partitions are expressed should be as concise as possible:—and the number of heads should not be needlessly multiplied. Another part of a discourse or sermon is narration. This part must be concise, clear, and distinct, and in a style correct and elegant, rather than highly adorned. The argumentative part is succeeded by the pathetic, in which, if any where, eloquence reigns, and exerts its power. (See PATHETIC.) In sermons, inferences from what has been said make a common conclusion. With regard to these care should be taken, not only that they rise naturally, but that they should so much agree with the strain of sentiment throughout the discourse, as not to break the unity of the sermon. The precise time of concluding a discourse is an object of importance. It should be so adjusted that our discourse is brought to a point; neither ending abruptly and unexpectedly; nor disappointing the expectation of the hearers, when they look for the close; and continuing to hover round and round the conclusion, till they become heartily tired of us. We should endeavour to go off with a good grace; not to end with a languishing and drawling sentence; but to rise with dignity and spirit, that we may leave the minds of the hearers warm; and dismiss them with a favourable impression of the subject, and of the speaker. Blair's Lectures, vol. ii. See ELOCUTION of the Pulpit, and PREACHING.

SERMON, *Funeral*. See FUNERAL.

SERMONES, the title which Horace gives his Satires. See SATIRE.

Critics are divided about the reason of the name; the opinion of father Bosiu seems best grounded. A mere observance of feet and measure, such as we find in Terence, Plautus, and in Horace's Satires, he thinks is not sufficient to constitute verse, to determine the work to be poetical, or to distinguish it from prose; unless it have some farther air, or character of poetry; somewhat of the fable or the sublime. Hence he judges it is, that Horace calls his Satires *prose*, or *sermons*: his Odes have quite another air, and are therefore called *poems*, *carmina*.

SERMONETTA, in *Geography*, a town of Italy, in the Campagna, situated on a mountain difficult of access. Some say that it occupies the site of the ancient Sora; but others say that it occupies the spot on which Sulmo stood; 13 miles S. of Veletri.

SERMONIUM, in *Old Records*, a kind of interlude or historical play, which the inferior orders of clergy, assisted by boys, &c. used at times to act in the body of the church, suitable to the solemnity of some festival or high procession day.

This is supposed to have been the origin of the modern drama.

SERMOUNTAIN, in *Botany*, a species of the laserwort in the Linnæan system, and, according to others, of the *sefels*, or wild spignel, which grows wild in some of the southern parts of Europe, is raised with us in gardens, and flowers in June.

The seeds of this plant are the part directed for use in our pharmacopœias, and the roots appear to be useful aromatics, though not regarded in practice; of an agreeable smell, and a warm glowing sweetish taste; the roots have the greatest warmth and pungency; the seeds the greatest sweetness, and the most pleasant flavour. A spirituous ex-

tract

tract of the seeds is a very elegant aromatic sweet. Lewis. See SESELI Seed.

SERMUR, in *Geography*, a town of France, in the department of the Creuse; 6 miles S.S.W. of Auzance.

SERNA, LA, a town of Spain, in the province of Leon; 24 miles N. of Palencia.

SERNANCHELLA, a town of Portugal, in the province of Beira; 19 miles S.E. of Lamego.

SERNETTY, a town of Bengal; 30 miles E.S.E. of Calcutta.

SERNICIUM, in *Ancient Geography*, a town of Italy, on the route from Milan to Colonne, in passing through Picenum, according to the Itinerary of Antonine, in which it is marked between *Aufidena Civit.*, and *Bovianum Civit.*

SERNON, in *Geography*, a town of France, in the department of the Var; 7 miles N.W. of Grasse.

SERNST, a town of Switzerland, in the canton of Glaris, near a river of the same name; 3 miles S. of Glaris. The river runs into the Sundbach at this place.

SEROGLAZOVSKAIA, a fortress of Russia, in the government of Caucasus, on the Volga; 24 miles N.W. of Astrachan.

SEROLZECK, a town of the duchy of Warsaw, at the union of the rivers Narew and Bug; 20 miles N. of Warsaw.

SERON, a town of Spain, in the province of Grenada; 7 miles W. of Purchena.

SERON of *Almonds*, is the quantity of two hundred weight; of anise-seed, it is from three to four hundred; of Castile soap, from two hundred and a half to three hundred and three quarters.

SERONGE, in *Geography*, a town of Hindoostan, in the Malwa country, celebrated for its manufacture of printed cottons and chintzes; 132 miles N.E. of Ougein. N. lat. $24^{\circ} 5'$. E. long. $78^{\circ} 4'$.

SEROOR, a town of Hindoostan, in Dowlatabad; 24 miles S.S.W. of Amednagar.

SEROS, Los, a town of the island of Cuba; 38 miles N. of Trinidad.

SEROSITY, the watery part of the blood, or *serum*. See BLOOD.

SEROTA, in *Ancient Geography*, a town of Pannonia, between Lentuli and Marinianæ.

SEROUGE, in *Geography*, a town of Asiatic Turkey, in the province of Diarbekir; 80 miles S.W. of Diarbekir.

SEROWRA, a town of Hindoostan, in Oude; 4 miles N. of Lucknow.

SERPA, a town on the E. coast of the island of Corfu; 8 miles N. of Corfu.—Also, a town of Portugal, in Alentejo, containing two churches, and about 4000 inhabitants; 12 miles S.W. of Mourao.

SERPA, in *Ancient Geography*, a town of Hispania, in Bætica, on the left of the river Anas, and nearly E. of Pax-Julia.

SERPEGER, in the *Manege*, was used to denote the riding a horse in the serpentine way, or in a tread with waved turnings like the posture of a serpent's body; but is now become obsolete.

SERPENTARA, in *Geography*, a small island near the E. coast of Sardinia. N. lat. $39^{\circ} 18'$. E. long. $10^{\circ} 2'$.

SERPENTARIA, in *Botany*, a name applied by the older botanical and medical writers, to various plants, either on account of the serpent-like form of their roots, as in *Polygonum Biflorum*, their spotted stems, as in *Arum Dracunculæ*, or some other fanciful resemblance. The same name has likewise been given to plants supposed to cure the

bites of serpents, as *Aristolochia Serpentaria*, or Virginian Snake-root. For a similar reason certain species of *Plantago* have been denominated *Serpentina*.

SERPENTARIUS, in *Astronomy*, a constellation of the northern hemisphere, called also *Ophiuchus*, and anciently *Æsculapius*.

The stars in the constellation Serpentarius, in Ptolemy's catalogue are 29; in Tycho's, 15; in Hevelius's, 40; in the Britannic catalogue, they are 74. See CONSTELLATION.

SERPENTES, SERPENTS, in *Zoology*, the second order in the Linnæan class Amphibia, which are thus commonly characterized: they are footless; their eggs are connected in a chain; the penis is double, and muricate.

These animals are sufficiently distinguished from reptiles by their total want of feet, moving by the assistance of their scales, and their general powers of contortion. The distinction of species in this numerous tribe is, according to Dr. Shaw, frequently very difficult. Linnæus thought that an infallible criterion might be found in the number of scaly plates on the abdomen, and beneath the tail; and accordingly attempted, in the *Systema Naturæ*, to discriminate the species by this mark alone. This is now found to be, by much, too uncertain and variable for a specific test. The colour is indeed frequently variable, but the pattern, or general distribution of markings in each species, appears to be more constant; the relative size of the head, the length of the body and tail, the size, smoothness, or roughness of the scales, as well as their shape in different parts of the animal, often afford tolerably certain specific marks.

The distinction of serpents into poisonous and innocuous, can only be known by an accurate examination of their teeth; the fangs, or poisoning teeth, being always of a tubular structure, and calculated for the conveyance or injection of the poisonous fluid from a peculiar reservoir, communicating with the fang on each side of the head: the fangs are always situated in the anterior and exterior part of the upper jaw, and are generally, but not always, of much larger size than the other teeth; they are also frequently accompanied by some smaller or subsidiary fangs, apparently destined to supply the principal ones, when lost either by age or accident. The fangs are situated in a peculiar bone, so articulated with the rest of the jaw, as to elevate or depress them at the pleasure of the animal. In a quiescent state, they are recumbent, with their points directed inwards or backwards; but when the animal is inclined to use them as weapons of offence, their position is altered by the peculiar mechanism of the above-mentioned bone, in which they are rooted, and they become almost perpendicular.

A general rule for the determination of the existence or non-existence of these organs, in any species of serpent, was proposed by Dr. Gray, in the Transactions of the Royal Society for the year 1788. According to this author, the fangs may be distinguished with great ease, by the following simple method. When it is discovered that there is something like teeth in the anterior and exterior part of the upper jaw, which situation he considers as the only one in which venomous fangs are ever found, let a pin, or other hard body, be drawn from that part of the jaw to the angle of the mouth. If no more teeth be felt in that line, it may be fairly concluded that those first discovered are fangs, and that the serpent consequently is venomous: if, on the contrary, the teeth first discovered be observed not to stand alone, but to be only part of a complete row, it may as certainly be concluded that the serpent is not venomous. This rule, however, like most other general rules, may have its exceptions; and perhaps the most legitimate test of real fangs

SERPENTES.

fangs in a serpent is their tubular structure, which may always be easily detected by the assistance of a proper magnifier. It is to be observed, that all serpents, whether poisonous or not, have, besides the teeth, whether fangs or simple teeth, in the sides of the upper jaw, two additional or interior rows, which are generally much smaller than the rest, and frequently scarcely visible. The general rule, therefore, is, that all venomous serpents have only two rows of true or proper teeth in the upper jaw, and that all others have four.

A head entirely covered with small scales is, in some degree, a character, but by no means an universal one, of poisonous serpents; as are also carinated scales on the head and body, or such as are furnished with a prominent middle line. All serpents cast their skins at certain periods: in the temperate regions, annually; in the warmer climates, perhaps more frequently. The serpents of the temperate and cold climate also conceal themselves, during winter, in cavities beneath the surface of the ground, or in some other convenient places of retirement, and pass the winter in a state more or less approaching, in the different species, to complete torpidity. Some serpents are viviparous, as the rattle-snake, the viper, and many other of the poisonous kind; while the common snake, and probably the greater part of the innoxious serpents, are oviparous, depositing, as we have already observed, their eggs, in a kind of string or chain, in any warm and close situation, where they are afterwards hatched. The broad undivided laminae, or scaly plates, on the bellies of serpents, are termed scuta; and the smaller or divided plates, beneath the tail, are called subcaudal scales; and from these different kinds of laminae, the Linnæan genera of serpents are chiefly instituted. In the edition of the *Systema Naturæ* by Gmelin, seven genera are enumerated and described, *viz.*

Acrochordus,	Cæcilia,
Amphibæna,	Coluber,
Anguis,	Crotalus.
Boa,	

Having, in our alphabetical arrangement, omitted a description of some of the above genera, and referred to the species of others which have not yet been given, we shall take the opportunity which the order itself gives us, of making up for the defects that have escaped our notice, beginning with

ACROCHORDUS, of which the generic character is, that it has tubercles covering the whole body. Gmelin gives but a single species, *viz.* the javanicus; but Dr. Shaw has described three

Species.

JAVANICUS; or Warty Snake. Brown, beneath paler; the sides obscurely variegated with whitish.

This, as its specific name denotes, inhabits Java, chiefly among the pepper plantations; it grows sometimes to the length of seven or eight feet. The warts or prominences appear, by a magnifying glass, to be convex carinate scales, and the smaller ones are furnished with two smaller prominences, one on each side the larger. The head is somewhat flattened, hardly wider than the neck; the body is gradually thicker towards the middle, and suddenly contracting near the tail, which is short and slightly acuminate.

This remarkable snake, which gave rise to the institution of the genus, was first described by Mr. Hornsted, in the Swedish Transactions for the year 1787. It was found in a large pepper-ground near Sangasan, in the year 1784, and measured eight feet in length. Its neck was six inches thick, that of the largest part of the body ten inches, and that of

the tail an inch and a half; the colour of the upper part of the animal was blackish, and of the under part whitish; the sides are marked with dusky spots; the head is truncated, depressed, and scaly; the jaws equal, the superior being emarginated beneath, the inferior curved; the eyes lateral, on the fore part of the head, the irides livid; the nostrils circular, small, approximated, and situated above the tip of the snout; the body was entirely covered, as well as the tail, with rough tri-carinated warts; the vent is small, the body very suddenly tapering towards the tail. This animal was secured by a Chinese, by means of a split bamboo passed over its neck, and thus carried to Batavia, where, on being skinned and opened, exclusive of a quantity of undigested fruit, were found completely formed five young, measuring nine inches each; the flesh of the animal was eaten by the Chinese, who affirmed that it was excellent food, and the skin being preserved in spirits, was brought over to Europe by Mr. Hornsted, and deposited in the museum of the king of Sweden.

DUBIUS, or Brown Acrochordus, has a carinated abdomen, and its sides are spotted with black. In its general appearance and proportion, this very nearly resembles the javanicus just described; but the head of the dubius is covered with very minute rough or warted scales, differing in size alone from those on other parts of the animal. It is not more than about three feet in length; its colour is of an obscure brown, with some ill-defined clouds and patches of a darker colour, dispersed along the sides and abdomen. The specimen from which this description is taken, is in the British Museum; but its native place is not ascertained.

FASCIATUS, or Fuliginous Acrochordus, called also the Hydrus granulatus, has a carinated abdomen, with whitish ascendant lateral bands. This is so much allied to the dubius, that it may be doubted whether it really differs in any other respect than age, size, and in the cast of colours, measuring about eighteen inches in length, and being of a dusky brown colour, with several paler fasciæ, which take their rise from the abdomen, and ascend on the sides; the abdomen is carinated as in the former. "This," says Dr. Shaw, "is certainly the Hydrus granulatus of Mr. Schneider, who, in his work on the Amphibia, describes it as a water-snake, though, seemingly, without any other foundation than its having a carinated abdomen; its other characters by no means agreeing with those of the genuine Hydri." Its native place is not known. A specimen is preserved in the British Museum.

ANGUIS, or Snake. This genus of serpents was noticed in its place, and the names of the species enumerated, with the intention of describing each species in the alphabetical order: after this the plan of the work was somewhat altered, and the species will now be given with their appropriate description. The generic character is, scales on the belly and scales under the tail.

Species.

STRIATUS. The scales of the belly are 179 in number; those of the tail seven; the body is surrounded with transverse lines.

MELEAGRIS. The scales on the belly of this are 165; those of the tail 32. It inhabits South America and some parts of India. It resembles the *Lacerta bipes* (see *LIZARD*); it is glaucous, with numerous longitudinal rows of black dots. There are two varieties, one dotted with brown, and one characterized by its long tail.

COLUBRINUS. Scales of the belly 180; of the tail 18. It inhabits Egypt: is varied with brown and pale ochre.

MILIARIS. Scales of the belly 170; of the tail 32. Found

SERPENTES.

Found near the Caspian sea: it is 14 inches long, and is about as thick as one's finger; black, with numerous pale scales or dots on the sides, and grey ones on the back; the head is grey, sprinkled with black; the tail is two inches long, much thinner than the body, cylindrical, obtuse, varied with white.

JACULUS. The scales of the belly of this species are 186, those of the tail 23: it inhabits Egypt.

MACULATUS. There are on this 200 abdominal scales; 12 subcaudal ones. It inhabits America; above it is yellow, with a brown dorsal stripe and linear bands. A variety is decussate with red bands dotted with black. It inhabits Asia.

RETICULATA. Scales on the belly 177; of the tail 37. This is an American snake. The scales are brown with a white disk.

CERASTES. Abdominal scales 200; subcaudal 15. It is found in Egypt.

NASUTUS. On the belly of this are 218 scales; on the tail 22. It is about a foot long; the colour is of a greenish-black; beneath, at the sides, on the tip of the head, a broad band on the tail, and dots on the tip, all yellow. The snout is prominent; it has no teeth; the eyes are on the top of the head, not lateral; the trunk is surrounded with 20 rows of hexagonal scales; the tail not quite half an inch long, with minute scales, and obtuse, rigid at the tip.

LUMBRICALIS. In this the scales of the belly are 230; those of the tail seven; it inhabits America. In colour it is whitish, inclining to yellow.

LATICAUDA. The abdominal scales are 200; the subcaudal 50. This is found at Surinam; the tail is compressed, sharp, pale, with brown bands.

SCYTALE. Scales of the belly 240; of the tail 13. As Dr. Shaw calls all the species of this genus by the English name slow-worm, so he denominates this the painted slow-worm, from its singular beauty; its general length is from eighteen inches to two feet, and its diameter in proportion; the ground colour is a rich yellowish-ferruginous or orange, on which are disposed throughout the whole length of the animal, numerous, moderately broad, equidistant, jet-black transverse bands, not continued entirely round the body, but alternating with each other, and terminating in rounded extremities; the scales on the intermediate parts are generally tipped with brown, exhibiting more or less of a speckled appearance on the skin. When this animal has been preserved a considerable length of time in spirits, many of its fine colours fade into white, in consequence of which, the specimens usually seen in museums, appear variegated only with black and white; the head is small, and the tail is very short, being not more than the twentieth of the whole length, and terminating obtusely. This species is a native of South America, and some of the West Indian islands.

* **ERYX;** Aberdeen Snake. The scales on this species of the belly are 126; those on the tail 136. It inhabits America and England. Above it is cinereous, with black lines the whole length, beneath it is lead-colour, with white spots. It has been thought to be only a variety of the next species.

* **FRAGILIS;** Blind Worm. Scales of the belly 135, and the same number on the tail. This species is found in almost all parts of Europe, in our own islands, and in Siberia, in similar situations with the common snake. It is a perfectly innoxious animal, living on worms and insects; its usual length is from ten to twelve inches, and sometimes even more; its colour is pale rufous-brown above, with three narrow longitudinal dorsal streaks of a darker cast; and beneath a deep lead-colour. The head is rather small, and

covered in front with large scales, as in most other innoxious serpents; the eyes are very small; the tail measures more than half the length of the animal, and terminates rather suddenly in a slightly acuminate tip. It is a viviparous animal, and sometimes produces a very numerous offspring; like other serpents, it varies in the intensity of its colours at different periods, and the young are commonly of a deeper cast than the parent; the general motions of this animal are rather slow than otherwise, except when endeavouring to escape, and the young seem to move more slowly than those that are full-grown. Slow-worms can, however, exert a considerable degree of swiftness, and can readily penetrate the loose soil, in order to conceal themselves from pursuit; they are often found in considerable numbers, during the winter season, at some depth beneath the surface, retiring on the approach of winter, and lying in a state of torpidity, and again emerging from their concealments on the approach of spring, when they cast their skin and recover their former liveliness. It has been observed by some naturalists, that if the individuals of this species, and of some others likewise, be struck with any degree of violence, the body not only breaks abruptly on the struck part, but even frequently at different parts; the skin is remarkably strong, and the animal, when handled or irritated, has a mode of stiffening itself by stretching to its utmost length, in which state, if any part of the skin be injured, the separation soon takes place in consequence of this rigidity. The fragments will live a long time after their separation.

VENTRALIS. Abdominal scales 127; subcaudal 223. This is an inhabitant of South Carolina. The body is of an ashy-green, striate; lateral band black; belly short, and appearing as if annexed by a hollow future; the tail is verticillate, three times as long as the body. A small blow will cause the animal to break into several pieces, the muscles being articulated quite through the vertebræ.

PLATURUS. Tail compressed, obtuse. It is a native of the shores of Pine island, in the Pacific ocean. The body is a foot and a half long; above it is black, and beneath it is white; the scales are minute, sub-orbicular, not imbricate; head oblong; it is toothless, smoothish; the back is subcarinate; the tail is variegated with black and white.

LINEATUS. Blackish, but on the upper part it is white: a curved line runs down the whole body.

CLIVICUS. Cinereous-brown; the plate of the front is larger and heart-shaped. It is found in some parts of Germany.

ANNULATUS. White, with straight brown bands meeting beneath, tail tapering, beneath with a double row of imbricate scales.

SCUTATUS. This is a very slender species; waved with white and black bands; plates of the head broad; tail sharpish. This is found at Surinam. The belly and tail beneath with transverse broad scales, like the boa. Gmelin thinks it does not belong to this species.

CORALLINUS. This is named by Shaw the pale-red slow-worm, with blood-red variegations, and by Seba it is called the red Brazilian serpent, so named probably from its colour, it being red with paler bands; the scales are tipped with black. This is a very elegant species; it is about a foot and a half long, the thickness is very considerable; the ground-colour is of a pale-red, with very broad, alternating fasciæ, and variegations of a deep coral red; the scales are moderately large, and of a rounded form, and the head and tail are remarkably obtuse. This highly beautiful animal is a native of the warmer parts of South America, where it is said to be found in woods, and to derive its sustenance from the larger

SERPENTES.

larger insects, as scolopendræ, &c.; in colour it sometimes varies, a mixture of black in different proportions being blended with the red on the sides, and the bands are also more numerous in some specimens than in others.

ATER. This, as its name denotes, is black with white bands; scales tipped with black. This is nearly allied in general appearance to the corallinus, but differing in colour; being white with black bands; the abdominal scales are dilated according to Seba's figure, on the authority of which, a beautiful engraving of it is given by Shaw. It is a native of South America.

RUFUS. Tawny, with transverse but interrupted white lines; beneath it is variegated. This is found at Surinam.

HEPATICUS. Line on the top of the back, and a waved line on each side, of liver-colour, the spaces between paler, with roundish whitish spots. It inhabits Surinam.

TESSELLATUS. This species is of a saffron colour, with numerous bands, and three stripes: the head is white, and spotted with brown. It inhabits Paraguay.

ALBUS. The individuals of this species are entirely white; tapering towards each end.

BOA, another genus of the serpent race, has been generally described in the alphabetical arrangement, with references to the species, which having been neglected in their places, must be noticed now. (See *BOA*.) The genus, according to Gmelin, includes ten species, but Shaw mentions others; we shall first mention those given by Gmelin.

Species.

CONTORTRIX; Hog-nosed Boa. The plates of the belly are 150 in number, and those on the tail 40. It inhabits Carolina; it is broad, and its back is convex; it is cinereous, with lateral round spots; it has a poisonous bag, but no fangs; the tail is about half the length of the body.

CANINA. This species has 203 plates on the belly, and 77 on the tail. It inhabits America. By Shaw it is named the Green Boa, with transverse, undulated, white dorsal bands. It is a highly beautiful snake, measuring, when full-grown, about four feet in length, and of a proportionable thickness; the head is large, and shaped like that of a dog; the colour of the whole animal on the upper parts is a most beautiful Saxon green, with several short, undulating, transverse white bars down the back, the edges of which are of a deeper or stronger green than the ground-colour of the body; the under or abdominal part is white. There is a specimen of this species in the British Museum.

A variety of this species is described by Seba; the ground-colour is of a bright orange, the dorsal bands are of a pale yellow, edged with red, and the abdomen is of a pale yellow. It is a native of the East Indies, differing merely in colour from the former.

HIPNALE. The plates on the belly are 179: those on the tail 120. It is found at Siam, and is of a yellowish colour, with white ocellate spots on the back.

CONSTRUCTOR. This, by some naturalists, is denominated the yellowish-grey boa, with a large chestnut-coloured chain-like pattern down the back, and subtriangular spots on the sides. Dr. Shaw gives the generic character thus: scuta, or undivided plates, both on the abdomen and beneath the tail. But by Gmelin it is characterized simply by the 240 plates on the belly, and 60 on the tail.

Of all the boas, the most conspicuous is the *B. constructor*, which is at once pre-eminent, from superiority of size, and beauty of colours; in this respect it appears to be subject to considerable variation from age, sex, and climate, but may be distinguished in every state from the rest of its tribe

by the peculiar pattern or disposition of its variegations. The ground-colour of the whole animal in the younger specimens is a yellowish-grey, and sometimes even a bright yellow; on which is disposed along the whole length of the back, a series of large, chain-like, reddish-brown, and sometimes perfectly red variegations, leaving large, open, oval spaces of the ground-colour at regular intervals: the largest or principal marks composing the chain-like pattern above-mentioned are of a squarish form, accompanied on their exterior sides by large triangular spots, with their points directed downwards; between these larger marks are disposed many smaller ones of uncertain forms, and more or less numerous in different parts: the ground-colour itself is also scattered over by a great many small specks of the same colour with the variegations; the exterior edges of all the larger spots and markings are commonly blackish, or of a much deeper cast than the middle part, and the ground-colour immediately accompanying the outward edges of the spots is, on the contrary, lighter than on other parts, or even whitish, thus constituting a general richness of pattern, of which nothing but an actual view of a highly-coloured specimen of the animal itself can convey a complete idea. In the larger specimens, the yellow tinge is often lost in an uniform grey cast, and the red tinge of the variegations sinks into a deep chestnut: and in some the general regularity of the pattern before described is disturbed by a kind of confluent appearance: the head is always marked above by a large longitudinal dark band, and by a narrower lateral band passing across the eye towards the neck.

The *boa constructor* is a native of Africa, India, the larger Indian islands, and South America, where it chiefly resides in the most retired situations in woody and marshy regions.

It was, in all probability, an enormous specimen of this very serpent that once diffused so violent a terror amongst the most valiant of mankind, and threw a whole Roman army into dismay. Historians relate this surprising event in terms of considerable luxuriance. Valerius Maximus mentions it from Livy, in one of the lost books of whose history it was related more at large, and the learned Frienshemius, in his *Supplementa Liviana*, has attempted a more ample and circumstantial narrative of the same event, of which the following is a quotation.

"In the mean time Regulus, every where victorious, led his army into a region watered by the river Bagrada, near which an unlooked-for misfortune awaited them, and at once affected the Roman camp with considerable loss, and with apprehensions still more terrible; for a serpent of prodigious size attacked the soldiers who were sent for water, and while they were overwhelmed with terror, and unequal to the conflict, engulfed several of them in its enormous mouth, and killed others by writhing round them with its spires, and bruising them with the strokes of its tail: and some were even destroyed by the pestilential effluvia proceeding from its breath: it caused so much trouble to Regulus, that he found it necessary to contest the possession of the river with it, by employing the whole force of his army; during which a considerable number of soldiers were lost, while the serpent could neither be vanquished nor wounded; the strong armour of its scales easily repelling the force of all the weapons that were directed against it; upon which recourse was had to battering engines, with which the animal was attacked in the manner of a fortified tower, and was thus at length overpowered. Several discharges were made against it without success, till its back being broken by an immense stone, the formidable monster began to lose its powers, and was yet with difficulty destroyed; after having diffused such a horror

SERPENTES.

horror among the army, that they confessed they would rather attack Carthage itself than such another monster: nor could the camp continue any longer in the same station, but was obliged to fly; the water and the whole adjacent region being tainted with the pestiferous effluvia. A most mortifying humiliation to human pride! Here at least was an instance of a whole Roman army, under the command of Regulus, and universally victorious both by sea and land, opposed by a single snake, which conflicted with it when living, and even when dead obliged it to depart. The proconsul, therefore, thought it no diminution to his dignity to send the spoils of such an enemy to Rome, and to confess at once the greatness of his victory and his terror, by this public memorial: for he caused the skin of the snake to be taken off and sent to the city; which is said to have measured 120 feet: it was suspended in a temple, and remained till the time of the Numanine war."

CENCHRIS, the Rufescent Boa, with large dusky dorsal rings, and blackish kidney-shaped lateral spots with white centres; it has 265 plates on the belly, and 57 on the tail. It inhabits Surinam; it is greenish, with white ocellate spots; the irids are grey.

OPHYRAS, or Brown Boa, has on its belly 281 plates, on the tail 84; the body is brown, and in appearance it resembles the *B. constrictor*.

ENYDRIS; or Water Boa. This species is variegated with different shades of grey; the teeth in the lower jaw are longer than usual in this genus; the number of abdominal scuta is 270, and of those on the tail 105. It is very like the *hortulana*, hereafter to be described.

MURINA; Grey Boa. This species has 254 plates on the belly, and about 65 on the tail. It inhabits America. It is glaucous, with round black spots.

SCYTALE; Spotted Boa. Cinereous, with large orbicular black dorsal spots, and annulated lateral ones, with white centres; it has 250 plates on the belly, and 70 on the tail.

This is scarcely inferior in size to the *B. constrictor*, and is of similar manners, destroying, like that animal, goats, sheep, deer, &c.; it is generally of a grey or glaucous colour, marked with large orbicular black spots on the back, and with smaller ones of a similar form, but with centres, on the sides; while on the abdomen are scattered several oblong spots, and marks interspersed with smaller specks and variegations. It is a native of several parts of South America, and like other large snakes is occasionally eaten by the Indians.

HORTULANA; Garden Boa. This is of a yellowish-grey, with brown variegations, those on the head resembling lace; the body sub-compressed, and the sides marked by wedge-shaped spots; it has 290 plates of the belly, of the tail 128.

This very elegant serpent, which is of a moderate size, measuring only a few feet in length, and being of a slender form, has obtained its specific name from the singular variegations on the head, which represent the form of a parterre in an old-fashioned garden; the variegations on the body are, like those on the head, of a blackish-brown, on a pale ferruginous or yellowish ground; they are disposed into large circular, and sometimes angular patches on the sides, the centres of some being open, and of others marked by an oblong spot; besides these there are others interspersed of smaller size and of different forms; the abdomen is commonly yellowish, with dusky specks and patches; the ground-colour of the whole snake is sometimes of a pale violet, and the variegations of a dark purplish-brown; but in all its varieties this species may be easily distinguished by the rich

embroidered appearance of the pattern, and more particularly by that on the top of the head; the head is also broader, and the neck more slender in proportion, than in most of the other boæ, the body slightly compressed, and the tail slender. It is a native of South America.

Such are the Linnæan species given by Gmelin; the following are additional ones, described by Dr. Shaw in his General Zoology.

REGIA; Royal Boa. With longitudinal striped neck, and body variegated either with brown and grey, or orange and rose-colour. This species, which is described by Seba, is, in its general shape, most allied to the canina and the phrygia. It varies very much with respect to colour, the ground-work being white, but the variegations sometimes dusky or chestnut, and sometimes of an elegant orange-red, accompanied by a tinge of blossom-colour on the lighter parts of the pattern; the top of the head is filled by a large patch, from which run two long parallel stripes to a considerable distance on each side the neck, leaving a wider stripe of the ground-colour along the upper part, and which afterwards ceasing, forms a part of the general variegation, which consists of a large chain-like dorsal band running down on each side, at moderately distant intervals, into obtuse processes, or situations regularly bordered by the white ground-colour, the intervening lateral spaces being much lighter, and each is marked by a dusky patch on the upper part; the under parts of the body and tail are white, the head is covered in front with large scales, the tail is extremely short, and tapers rather suddenly.

PHRYGIA; Embroidered Boa. White, with a greyish cast on the back; the body is most elegantly marked with black lace-like variegations.

This is unquestionably one of the most elegant species of the whole serpent tribe; its variegations are so conducted, as to bear a striking resemblance to an embroidery in needlework. It is a native of the East Indies, where divine worship is paid to it.

FASCIATA; Fasciated Boa. With subtriangular body annulated with blue; is a native of India, and most generally found in the country of Bengal. It is of a yellow colour, marked with numerous dusky-blue transverse bands, continued at equal distances throughout the whole length of the animal, each band completely investing the body; the body is of a trigonal form, the sides sloping very considerably; along the ridge of the back runs a continued series of hexagonal scales. This snake is among the number of poisonous species, and its bite is considered by the Indians as fatal. A specimen was brought to Dr. Ruffel in the month of November 1788, in an apparently very weak and languid state. Being set at liberty, it shewed no disposition to bite; it suffered a chicken to get on its back, without noticing it; but the thigh of the bird being put within its jaws, it shewed immediate symptoms of having been poisoned, and it expired in the course of half an hour. This was the only experiment which was made, the snake dying the next day; but from the languid state in which it appeared, and the effect of its bite on the chicken, it may be concluded that, when in full vigour, it must be an animal of a highly dangerous nature.

VIPERINA; Viperine Boa. Grey, with a black, undulating, dorsal band, edged with white; and the sides spotted with black. It is about a foot and a half in length, and of a moderately brown colour. It is said to produce by its bite a slow wasting of the fingers and toes, similar to what happens in some leprous cases. A living specimen, however, was obtained in 1778, and though in good health, yet its bite was not followed by any deleterious effects.

LINEATA, Lineated Boa, called also *Geedi Paragoedop*, is

is of a slender form, with the general appearance of a coluber rather than a boa. It is of an extremely dark blue colour, so as to appear almost black in certain lights, and is marked throughout the whole length of the upper part by several transverse curved and dotted white lines at unequal distances, and varying in number in different individuals, from about 42 to 50: they are so disposed, as almost to represent so many large spotted circles. Dr. Shaw has given an account of some experiments on this animal, to whose work we refer our readers. See General Zoology, vol. iii. part ii.

HORATTA. This is of a dark brown, with a waving yellow band on each side, and a row of dorsal spots. This is one of the smaller species, measuring only about fifteen inches in length. The fangs, or poisoning organs of this snake, shew that it is noxious, but in what degree has never been ascertained; it is, however, said to be one of the most fatal.

PALPEBROSA. Whitish, obscurely fasciated with grey; with prominent eye-lids; this has 112 abdominal scuta, and 51 on the tail.

ANNULATA. Subferruginous, with black, orbicular, dorsal spots included in rings; reniform, ocellated, lateral spots, and abdomen undulated with dusky variegations. This is about two feet long, and in its general appearance it is allied to the *B. hortularia* and *enydris*. It is a native of South America.

SERPENTS, in *Astronomy*, a constellation in the northern hemisphere, called more particularly *Serpens Ophiuchi*. The stars in the constellation *Serpens*, in Ptolemy's catalogue, are 18; in Tycho's, 13; in Hevelius's, 22; and in the Britannic catalogue, 64. See CONSTELLATION.

SERPENT Cucumber, in *Botany*. See *TRICHOSANTHES*.

SERPENS Hypnoticus. See *HYPNOTICUS*.

SERPENS Marinus. See *SEA SNAKE*.

SERPENS Rubescens, the *red serpent-fish*, in *Ichthyology*, the name of a fish, properly of the *tænia* kind.

It resembles the common snake in figure, and is of a fine strong red in colour, and marked with oblique lines all down the sides, and long ones from the gills to the tail, one on each side; its mouth is but small, and its teeth sharp and serrated; and it has all over its back a number of fine capillaments, set at distances from one another, even to the tail, and the same on the belly; its tail ends in a single fin.

SERPENS Terrenus, the *earth-serpent*, a name given by some of the chemical writers to nitre. It was originally given to the nitre of the ancients, a salt very different from that which we call nitre, but it has since been applied also to that salt.

SERPENT-Stones. See *SNAKE-Stones*.

SERPENT'S-Tongue, in *Botany*, a genus of the *cryptogamia filices* class; comprehending five species. See *ADDER'S-tongue*.

SERPENTS' Tongues. The island of Malta abounds with glossopetræ, or the petrified teeth of sharks, which, from their resemblance to a tongue, are by the vulgar supposed to be the tongues of serpents turned into stone by some miracle of St. Paul, when he was there. This island abounds not only with these, but with bufonitæ, and vast numbers of other remains of sea productions.

Augustino Scilla, who has written at large on the fossils of this island, gives a very rational account of their being the real remains of animals, which, according to his system, it is no way wonderful to find there.

In regard to the island of Malta, which so abounds with them at this time, he supposes that long since the time of the creation, and even without the assistance of the general

deluge, it may have been formed out of the sea, and that it appears plainly to have been at first no other than a mass of soft mud, with an immense number of sea-shells, teeth of fishes, and other remains of sea-animals mingled among it; and that these subsiding as low as they could among that thickening matter, have made the island what we now find it, that is, a heap of earth with these things in vast quantities buried in it, and at different depths. *Philos. Transf.* N° 219, p. 182.

And though there are found among these teeth, &c. in the island of Malta, great quantities of shells, of such species as are not natives of those seas, this is no objection to the opinion; since it is well known, that the winds, when violent, as they probably were about the time of the formation of that island, will bring such light bodies as shells a vast way in water.

The mountains of Sicily afford some few glossopetræ, or snakes' tongues, but they are few in number, and worse prepared than those of the island of Malta; which is probably owing to the high ground of those mountains being less likely to receive the refuse of the sea, and its soil, which is sandy, being less fitted to preserve them when there than the marle, of which the island of Malta consists.

The echini marini, or sea-eggs, and their species, which are very frequent among the serpents' tongues of Malta, all lie upon the surface of the ground, or near it; whereas the glossopetræ lie deeper, though at no great depth. This is a plain effect of all these things having been really animal bodies, and having floated in the mud, of which that island was formed; for in this it could not be otherwise, but that the glossopetræ, or serpents' tongues, being heavy, would subside in the water, while the light shells of these other animals would float on or near the surface.

Whenever the glossopetræ are taken carefully up out of the earth in Malta, the marle or earth, which served for their bed, is found to contain all their minutest traces and lineaments, like wax from a seal. This is a proof that the marle was as soft as melted wax when they were put into it, and that they were of the full size and growth when placed there, not having grown, or had any increase in that place.

The apophyses, or processes in the glossopetræ, are also a strong proof of their being no other than real sharks' teeth, since they exactly answer to those in the teeth of recent sharks, by which every tooth is received or inserted into its neighbour in the jaw. Nay, whereas sharks' teeth are mortified into one another in such a manner, that a man may easily tell which belongs to each side, which lie near the throat, and which near the front of the mouth; and whereas, in a shark's mouth, the teeth on the left side will not fit on the right, nor those above serve below, but that on seeing a recent tooth, a person of judgment will be able to say what part of the mouth it belonged to; so in the fossil sharks' teeth, or glossopetræ, there is not any one which may not be referred to the particular part of the mouth of the living animal, and could have belonged to no other. Augustino Scilla, de Petrificac. See GLOSSOPETRA.

SERPENT, in *Music*, a wind instrument of the bassoon kind, blown by a mouth-piece. It has its name from its serpentine figure; and is composed of two pieces of walnut-tree-wood, and covered with thin leather or shagreen.

This instrument has six holes, which give it a compass of twenty-seven notes. The mouth-piece is fixed in a socket of copper or silver. Its neck is curved, and its mouth-piece is of wood or ivory.

It is held in such a manner, as that the fore-finger, the middle-finger, and the ring-finger of the left hand, can stop the

the holes 1, 2, and 3; and the same fingers of the right hand, stop the holes 4, 5, and 6.

The abbé de Bœuf, in his *History of Auxerre*, tom. i. p. 643, says that, about the year 1590, Edmond Guillaume, a canon of Auxerre, found the means of boring and turning a cornet in the form of a serpent, which was used in concerts at his house, and the instrument having been perfected became common in the great churches. For the scale and compass of the serpent, see Laborde.

In France, the serpent used to be confined to the military bands; at present, says M. Laborde, it is confined to the church and processions. In cathedrals there is one on each side the choir.

Merfennus, who had studied this instrument, says, that if unfolded and straight, it would be more than six feet long. Laborde says eight feet. The compass of the instrument is now probably extended, which in the scale given in the folio *Encyclopédie* is from double B flat in the bass, to F in the first space of the treble.

Merfennus, who has particularly described this instrument, mentions some peculiar properties of it, *e. g.* that the sound of it is strong enough to drown twenty robust voices, being animated merely by the breath of a boy, and yet the sound of it may be attuned to the softness of the sweetest voice. Another peculiarity of this instrument is, that great as the distance between the third and fourth holes appears, yet, whether the third hole be open or shut, the difference is but a tone.

SERPENT, in *Mythology*, was a very common symbol of the sun, and he is represented biting his tail, and with his body formed into a circle, in order to indicate the ordinary course of this luminary; and under this form it was an emblem of time and eternity.

The serpent was also the symbol of medicine, and of the gods which presided over it, as of Apollo and Æsculapius: and this animal was the object of very ancient and general worship, under various appellations and characters. In most of the ancient rites we find some allusion to the serpent, under the several titles of Ob, Ops, Python, &c.

The idolatry is alluded to by Moses, Lev. xx. 27. The woman of Endor, who had a familiar spirit, is called *Oub*, or *Ob*, and it is interpreted Pythonissa: the place where she resided, says the learned Mr. Bryant, seems to have been named from the worship then instituted; for Endor is compounded of *En-ador*; and signifies *sons pithonis*, the fountain of light, the oracle of the god Ador; which oracle was probably founded by the Canaanites, and had never been totally suppressed. His pillar was also called *Abbadir*, or *Abadir*, compounded of *ab* and *adir*, and meaning the serpent deity *Addir*, the same as *Adorus*.

In the orgies of Bacchus, the persons who partook of the ceremony, used to carry serpents in their hands, and with horrid screams call upon Eva! Eva!

Eva being, according to the writer just mentioned, the same as epha, or opha, which the Greeks rendered *ophis*, and by it denoted a serpent.

These ceremonies, and this symbolic worship, began among the Magi, who were the sons of Chus; and by them they were propagated in various parts. Wherever the Ammonians founded any places of worship, and introduced their rites, there was generally some story of a serpent. There was a legend about a serpent at Colchis, at Thebes, and at Delphi; and likewise in other places. The Greeks called Apollo himself *Python*, which is the same as *Oupis*, *Opis*, or *Oub*.

In Egypt there was a serpent named *Thermuthis*, which

was looked upon as very sacred; and the natives are said to have made use of it as a royal tiara, with which they ornamented the statues of Isis. The kings of Egypt wore high bonnets, terminating in a round ball, and surrounded with figures of asps; and the priests likewise had the representation of serpents upon their bonnets.

Abaddon, or Abaddon, mentioned in the Revelations, xx. 2. is supposed by Mr. Bryant to have been the name of the Ophite god, with whose worship the world had been so long infected. This worship began among the people of Chaldea, who built the city of Ophis upon the Tigris, and were greatly addicted to divination, and to the worship of the serpent. From Chaldea the worship passed into Egypt, where the *Serpent* deity was called *Canoph*, *Can-eph*, and *C'neph*; it also had the name of *Ob* or *Oub*, and was the same as the *Basiliscus*, or *royal Serpent*, the same as the *Thermuthis*, and made use of by way of ornament to the statues of their gods. The chief deity of Egypt is said to have been Vulcan, who was styled *Opas*; he was the same as *Ophris*, the *Sun*, and hence was often called *Ob-el*, or *Pytho sol*; and there were pillars sacred to him, with curious hieroglyphical inscriptions, bearing the same name, whence among the Greeks, who copied from the Egyptians, every thing gradually tapering to a point was styled *obelos*, or *obeliscus*.

As the worship of the serpent began among the sons of Chus, Mr. Bryant conjectures, that from thence they were denominated *Ethiopians* and *Aithiopians*, from *Ath-ope*, or *Ath-opes*, the god whom they worshipped, and not from their complexion: the Ethiopes brought these rites into Greece, and called the island where they first established them, *Ellopiea*, *Solis Serpentis insula*, the same with *Eubœa*, or *Oubaia*, *i. e.* the *Serpent-island*.

The same learned writer discovers traces of the serpent worship among the Hyperboreans, at Rhodes, named Ophiusa, in Phrygia, and upon the Hellespont, in the island Cyprus, in Crete, among the Athenians, in the name of *Cecrops*, among the natives of Thebes in Bœotia, among the Lacedæmonians, in Italy, in Syria, &c. and in the names of many places, as well as the people where the Ophites settled. One of the most early heresies introduced into the Christian church was that of the Ophitæ. Bryant's *Analysis of Ancient Myth.* vol. i. p. 47, &c. p. 473, &c.

SERPENT *Islands*, in *Geography*, small islands near the N. coast of lake Huron. N. lat. 46° 2'. W. long. 82° 45'.

SERPENTS, *Island of*. See SZALGON.

SERPENTINA, in *Botany*. See SERPENTARIA.

SERPENTINE, in *Chemistry*, a worm, or pipe of copper or pewter, twisted into a spiral, and ascending from the bottom of the alembic to the capital, and serving in the distillation of rectified spirit of wine.

SERPENTINE, in *Mineralogy*, a stone, which derives its name from the variety of its colours, supposed to resemble those of the serpent. The ancients called this stone *ophites*, from the Greek *οφις*, *serpent*, as being speckled like a serpent's skin. The most prevailing colour is green of different shades, spotted with red, or with dark green, and also clouded and veiny. Some serpentines are red, varying from a peach-bloom to a blood-red or scarlet. In rich variety of colours, this stone far exceeds any other of the great rock-formations. It will receive a high polish, and is nearly indestructible by fire or acids, and is therefore eminently suited for ornamental sculpture or architecture. The hardness of serpentine is variable: some kinds scarcely yield to the knife, others are easily worked. It is infusible by the blowpipe; the fracture is splintery, passing into small conchoidal;

SERPENTINE.

choidal; the fragments are translucent at the edges; the lustre is somewhat resinous, and when powdered, it has an unctuous soapy feel. The specific gravity varies from about 2.6 to 2.7. Serpentine seems nearly allied to the mineral called *hornblende*, from which it differs in its constituent parts by containing more magnesia and less iron. Chrome has been found in some serpentines. The analysis of different serpentines shews a considerable variation in the proportion of their constituent parts,

from 45	to 29	Silex,
18	23	Alumine,
23	34	Magnesia,
3	4	Iron,
11	10	Water and loss.

Some serpentines contain 6 per cent. of lime.

The disciples of Werner divide serpentine into two species, the one called the noble serpentine, the other the common serpentine; the former they consider as older, and having a different geological position to the common serpentine; but for this distinction there does not appear sufficient reason, as the same beds will furnish specimens of both kinds. The noble serpentine has the richest variety of colours and the greatest degree of translucency. Serpentine, though not very rare in many alpine districts, is by no means so common as granite, slate, and limestone. Serpentine occurs in beds in gneiss and primary limestone, and in mica-slate: it also covers many rocks in amorphous masses, and may be observed graduating into chlorite or talc-slate. Serpentine has been remarked to exist generally at a low level in alpine districts; but there are some remarkable exceptions to this, particularly in the summits which surround the central parts of mount Rosa, in Switzerland. These summits have an elevation of more than 1700 fathoms, formed of beds of serpentine lying in a position generally horizontal.

Serpentine is more abundant in Europe, than any other part of the globe that has been yet explored. The whole front of the Alps facing Italy contains serpentine almost in every part, although there is very little in the side towards Switzerland. It extends through Italy, where it is called *gabbio*. One of the finest varieties is at the hills of *Impronetta*, near Florence: it contains much of that green, semitransparent, and fatty substance, which Sauffure calls *smaragdite*, on account of its fine emerald-green colour. France has some mountains of serpentine, especially in Limousin.

The finest serpentines of Spain are from Sierra Nevada; two leagues from Grenada, they have a green base filled with glistening plates of a yellow colour. Superb columns have been made of it, which decorate the churches and palaces of Madrid. According to Patrin, serpentine is almost entirely wanting in northern Asia, with the exception of the eastern part of the Ural mountains, which separate Europe from Asia. There are some hills of serpentine, which at great intervals accompany their base, following their direction from north to south; there are also some detached branches which appear near Tobolsk, which is not far from these mountains. But from hence to the river Amur, a space of about three thousand miles, scarcely any vestiges are found either in the great chains of Altai, Sayennes, or the mountains of Daouria. The serpentines most known in Europe are those of Saldbergh in Sweden, and Zeoblitz in Saxony, from which vases of every kind are turned and exported to distant countries. The serpentine of Bayreuth is filled with garnets of the size of a pea, dispersed equally through the mass. When the stone is polished, they present a pleasing mixture of fine red spots

in a green base. Trinkets and other ornaments are made of it.

The mountain called Roth Horn, or Red Horn, which faces mount Rosa towards Italy, is elevated 1506 fathoms; it is composed of immense masses of serpentine of an irregular shape. The surface of this serpentine becomes a deep red by the action of the atmosphere, which oxygenates the iron it contains. It is this colour, and the elongated form, that have occasioned the mountain to be called Red Horn.

The serpentine of this mountain is covered by a steatite of a sea-green colour, mixed with carbonate of lime and grains of felspar. On this serpentine are laid beds of micaceous schist, intermixed with limestone, composed of more than one half of mica. These are again covered by serpentine: all the beds are nearly horizontal, rising a little towards mount Rosa.

Mount Crevin, another mountain near mount Rosa, is an inaccessible obelisk of a triangular form, which is elevated 2309 fathoms above the sea. It is composed of three distinct masses; the uppermost, which forms the summit, is of a yellow isabella colour. It is composed of serpentine mixed with micaceous schist, containing limestone and quartz. The middle is of gneiss and micaceous schist, and the lower one or base of the pyramid is serpentine; but the most remarkable hill of serpentine is in the chain of mountains that separates the margravate of Bayreuth from the Upper Palatinate. Its elevation above the plain is about 300 feet; it extends in a direction from east to west. The rocks which crown the summit are of very pure serpentine, divided into beds, and reposing on gneiss and hornblende. M. Humboldt having brought his compass near these rocks of serpentine, saw with surprise, that the north pole of the needle flew round to the south. He further observed, that the rocks on the northern and southern declivities have opposite poles. The eastern and western extremities of the hill do not exert any action on the magnetic needle, though the appearance of the stone is the same as on the north and south declivities. In the magnetic parts of the hill certain rocks are also observed, which are not magnetic in junction with similar rocks, that exert a strong action on the needle, some of them at the distance of 22 feet. The mountain not only exerts its action on the needle in its whole mass, like some other hills, it is manifest even in small fragments.

Humboldt observed, that minute fragments are briskly moved on presenting them to the point of a weak magnet; but they have not the least attraction for iron not magnetized. Humboldt convinced himself that this serpentine does not contain an atom of magnetic iron, all which it contains is in the state of oxyd. Its specific gravity is much less than that of other serpentines, scarcely reaching to 2000, that of common serpentine being upwards of 2700. This mountain of serpentine, taken in the aggregate, may be regarded as one large natural magnet, having two poles, the part equidistant from each displaying no signs of magnetic power, as is the case with small natural and artificial magnets. Like them too, if a fragment be broken from the mass, each small piece has its north and south pole, and a central part, which is not magnetic. That particular kind of soft serpentine, which is capable of being turned into vessels that resist the action of the fire, is called pot-stone, and has been already described. See *Pot-Stone*.

Steatite and amianthus, a fibrous asbestos, are almost always associated with serpentine. (See *ASBESTUS* and *STEATITE*.) The finest amianthus occurs in Corfica forming

ing beautiful white silky threads of two or more feet in length, and is so abundant, that Dolomieu made use of it instead of flax to pack his minerals in when in that island.

Serpentine exists in various parts of the highlands of Scotland and the Hebrides; it is found both pure and alternating with mica-slate and limestone.

No well-characterized rocks of serpentine are known in South Britain, except in Cornwall and the Isle of Anglesea. The serpentine of Cornwall is not particularly distinguished for the beauty of its colours. Rocks of this mineral extend to the Lizard Point.

The most beautiful variety of serpentine in Great Britain, or perhaps in Europe, is that on the western side of Anglesea. It occurs at a low elevation associated with rocks of talcous slate. The beds are of considerable size, and divided by seams of asbestos. Some of the serpentine is intermixed with white crystalline limestone, like the verde antique from Italy; but the particles of white are generally smaller. Veins of quartz and steatite, with brilliant laminae of schiller spar, also occur in some of the beds. It is sufficiently hard to resist the point of a copper tool, and takes a high polish. The colours are various shades of light and dark green and red, varying from a peach-bloom to a blood-red scarlet. The colours are intermixed and distributed in an infinite variety of spots and clouds, the effects of which are heightened by polishing.

Messrs. Bullock and Co. in Oxford-street, have established a manufacture of chimney-pieces, columns, and other ornamental articles of this stone, which has the advantage, being raised in vast blocks, so as to form columns and slabs in one piece, from 12 to 20 feet in length, and of proportionate diameter and breadth. A column of 12 feet in one shaft, composed of red serpentine, which we measured at Messrs. Bullock's manufactory, weighed two tons, and had no perceptible flaw or blemish in the whole piece. This is the most durable as well as the richest of British stones applied to ornamental sculpture, and is not exceeded in the variety or freshness of its colours by any of the costly marbles of Italy.

The Mona marble, as this serpentine is called by the proprietors, is not liable to have its colours injured by common fire, which is the case with many marbles, when made into chimney pieces; neither are the colours affected by acids, air, or moisture.

With such a valuable material for ornamental sculpture in our own island, it is greatly to be regretted, that such large sums should be annually paid to foreign nations in the purchase of stone for similar purposes, which is less durable and less beautiful. It would surely be more patriotic to encourage the proper application of the mineral treasures of our own country.

The stone called verde antique is a mixture of green serpentine with white granular limestone. See VERDE Antique.

SERPENTINE, in the *Manege*. A horse is said to have a serpentine tongue, if it is always frisking and moving, and sometimes passing over the bit, instead of keeping in the void space, called the liberty of the tongue.

The Romans, in breaking and dressing their horses, used to work them in *waving* or *serpentine* lines, as the practice is, or ought to be, at present. The French call this riding a horse *en serpentant*. The Greeks and Romans know it by the term of riding in *Meanders*, in allusion to the windings and doublings of the celebrated river which bore that name.

SERPENTINE Column. See COLUMN.

SERPENTINE *Verfes*, are such as begin and end with the same word. As,

“Ambo florentes ætatis, Arcades ambo.”

SERPHERANT, in *Geography*, a village of Syria, supposed to be the ancient *Sarepta* (which see); 14 miles S.S.W. of Saïde.

SERPHO, the ancient *Seriphus*, an island in the Grecian Archipelago, about 36 miles in circumference. Its mountains are so rugged and steep that the poets feigned the natives to have been transformed into stone by Perseus. Here are mines of iron and loadstone. The inhabitants belong to the Greek church: they pay 800 crowns to the grand seignior, for the capitation and land-tax. The produce is but small. The onions are in high estimation. It was made a place of exile by the ancient Romans. N. lat. 37° 10'. E. long. 24° 34'.

SERPHO *Poulo*, a small island, five miles N.E. of the former.

SERPI, *Grotta del*. See GROTTA.

SERPICULA, in *Botany*, derived from *serpo*, to creep, a name given by Linnæus to the present genus, in allusion to its creeping habit and diminutive stature.—Linn. Mant. 16. Schreb. 628. Willd. Sp. Pl. v. 4. 329. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 257. Pursh v. 1. 33. Juss. 318. Lamarck Illustr. t. 758. (*Laurebergia*; Berg. Cap. 350. Elodea; Michaux Boreal-Amer. v. 1. 20.)—Class and order, *Monocotyledon Tetrandria*. Nat. Ord. *Inundata*, Linn. *Onagraceæ*, Juss.

Gen. Ch. Male, *Cal.* Perianth minute, four-toothed, erect, acute, permanent. *Cor.* Petals four, oblong, acute, sessile. *Stam.* Filaments four, very short; anthers oblong, about equal to the petals.

Female, on the same plant. *Cal.* Perianth superior, minute, in four deep permanent segments. *Cor.* Petals three, or none. *Pist.* Germen inferior, ovate, furrowed; style short; stigmas obtuse. *Peric.* Nut cylindrical, furrowed, of one cell, deciduous. *Seed* one, or more, oblong.

Ess. Ch. Male, Calyx four-toothed. Petals four. Female, Calyx in four deep segments. Nut.

Obs. The second species differs widely from the original generic characters, being dioecious, with three-cleft flowers, and several seeds. The whole wants revision.

1. *S. repens*. Cape Serpicula. Linn. Mant. 124. Suppl. 416. Willd. n. 1. Ait. n. 1. (*Laurebergia repens*; Berg. Cap. 350. t. 5. f. 10.)—Leaves scattered, lanceolate, entire.—Native of the Cape of Good Hope. Sent to Kew, by Mr. Maillon, in 1789. It is a perennial, herbaceous, greenhouse plant, flowering in July and August. *Stem* branched, leafy, creeping by fibrous radicles. *Leaves* acute, three-quarters of an inch long. *Flowers* axillary, two to four together; the males are described by Bergius and Linnæus as stalked.

2. *S. verticillata*. East Indian Serpicula. Linn. Suppl. 416. Willd. n. 2. Roxb. Coromand. v. 2. 33. t. 164.—Flowers three-cleft. Leaves whorled, finely serrated.—Native of clear standing sweet water in the East Indies, flowering during the cold season. This is dioecious. The male flowers are sessile, and without a tube, but the female ones have a long tube, and a sheath-like calyx. Both male and female are three-cleft. The seed-vessel seems an oblong capsule, with four seeds, one over another.

3. *S. veronicifolia*. Bourbon Serpicula. Willd. n. 3.—“Leaves opposite, ovate, toothed at the summit.”—Native of rocks in the isle of Bourbon. *Bory de St. Vincent*.—Stems creeping, slender, red. Leaves thickish, a line, or line and half,

half, long, resembling those of *Veronica agrestis*. Flowers monoecious, four-cleft, reddish, very minute.

4. *S. occidentalis*. American Serpicula. Pursh n. 1. (*Elo-dea canadensis*; Michaux Boreal-Amer. v. 1. 20.)—"Flowers united. Stigmas ligulate, cloven, reflexed. Leaves ternate, linear, acute."—Frequent in stagnant waters, from Canada to Virginia, flowering in July. Perennial. Flowers white, very small and delicate. Leaves when magnified very finely serrulated. In the early part of the season they are, as Michaux describes, oblong and obtuse, but at the flowering time long, linear, and acute. Pursh.

SERPIGO, in *Medicine*, from *serpere*, to creep, is nearly synonymous with *herpes*, and signifies, in the language of the older writers, any spreading tetter, or excoriation of the skin. When the tetter is stationary, according to Forestus, it is called *impetigo*; but when it spreads and creeps from one place to another, it is called *serpigo*. (See Forest. Obf. Chirurg. lib. ii. obf. 11.) It is the property, however, of many eruptive diseases to spread in this manner, though very different in their nature from each other; whence in the more accurate nomenclature of the present day, the term *serpigo* is not used. It would be applicable, in fact, to diseases of every class, pustular, scaly, papular, and vesicular; to the diseases called impetigo, lepra, psoriasis, lichen, herpes, eczema, &c. It is, therefore, justly exploded.

SERPUCHOV, in *Geography*, a town of Russia, in the government of Moscow; 40 miles S. of Moscow. N. lat. 55°. E. long. 37° 2'.

SERPULA, in *Conchology*, a genus of the order Testacea, of which the generic character is, animal a terebella: shell univalve, tubular, and generally adhering to other substances; often separated internally by divisions at uncertain distances. There are about fifty species included in this genus, of which several are found in our own country.

Species.

NAUTILOIDES. Shell flattish, minute, confluent, verrucose, spiral, with very thin semilunar internal divisions. It is found in the seas about Norway, adhering to the *Madrepora prolifera*, is very minute, brownish, or white; of an uncertain figure, sometimes rather oblong, sometimes more orbicular; the divisions are parallel, the aperture very narrow.

SEMILUNUM. The shell of this is regular, loose, glabrous. It is found in the Adriatic and Red seas, and sometimes it is obtained fossil. The shell is scarcely larger than a grain of sand, white and yellowish; the whorls are pressed close together; the aperture is narrow, and compressed.

PLANORBIS. In this species the shell is orbicular, regular, flat, equal. It is found adhering to shells. The shell resembles a round scale, and when broken horizontally it exhibits the appearance of a spire in minute concentric circles.

SPIRILLUM. Shell regular, spiral, orbicular, pellucid, with round gradually decreasing whorls. It inhabits the ocean, on zoophytes, fustulariæ, and other marine substances; it resembles the next, which is a native of this country, but is much less than it.

* SPIROBIS. Shell regular, spiral, orbicular, the whorls slightly caniculate above and inwardly, and growing gradually less towards the centre. It inhabits moist seas, adhering to fuci and zoophytes. There is a variety; the shell is white, without polish, not complicated, but disposed singly on the substance to which it is attached; the aperture is circular.

* TRIQUETRA. The shell of this is creeping, flexuous, triangular. It inhabits the ocean, adhering to marine substances, stones, and the bottoms of ships; is from half an inch to an inch long. The shell is white, pellucid, irregularly twisted, carinate on the back, sometimes denticulate, with a narrow circular aperture.

* INTRICATA. Shell filiform, rough, round, intricately twisted. It inhabits the European and Indian seas, and often on our own coasts, upon shells. The shell is of a greenish-white, a little rugged and coarse.

FILOGRANA. Shell capillary, fasciculate, in branched complications, and cancellate. It inhabits the Mediterranean; is four inches long, and forms a beautiful kind of network.

GRANULATA. The shell of this is round, spiral, glomerate, with elevated ribs on the upper side. It inhabits the North seas, in large masses, adhering to stones, shells, &c. The shell is white, and the size of a coriander seed.

* CONTORTUPLICATA. The shell is angular, rugged, and irregularly entwined. It is found in the European and American seas, and on our own coasts; is from three to four inches long; and sometimes it is as large as a goose-quill; the shell is white, cinereous, or yellowish-brown; within it is smooth, transversely striate.

GLOMERATA. The shell of this species is round, glomerate, with decussate wrinkles. It inhabits the European and Atlantic seas, in large masses. The shell is white, grey, or brownish; within it is smooth.

LUMBRICALIS. The shell of this is round, flexuous, with a spiral acute tip. There are three varieties of this species, which are found in the Atlantic and Indian seas, in large masses. The shell is from three to five inches long, transversely ribbed and longitudinally wrinkled.

POLYTHALAMIA. The shell of this is likewise round, diaphanous, smooth, straightish, with numerous internal divisions. It inhabits the Mediterranean and Indian seas, under the sand. The shell is outwardly white, transversely wrinkled, and annulate; the inside is separated by imperforated convex and concave divisions, making it appear as if it consisted of numerous united tubes.

ARENARIA. Shell jointed, entire, distinct, flattish beneath. It is found in India, and divers parts of the coast of Africa. It is probably a teredo, hereafter to be described. The shell is white, with pale brown undulate rays, or whitish; the outside cancellate, within it is smooth; spirally twisted: there are about a hundred striæ, which are sometimes nodulous.

ANGUINA. Shell roundish, sub-spiral, with a longitudinal jointed cleft. It inhabits the Indian ocean; varies much in figure, being sometimes round and sometimes angular; it is more or less flexuous, glabrous or rough, with the joints of the cleft often obsolete. There is a variety of this species.

* VERMICULARIS. Shell round, tapering, curved, wrinkled. It inhabits the European seas, and is from two to three inches long. The shell is whitish, ending in an obtuse point; the inhabitant is of a bright scarlet, with elegantly feathered tentacula, from the middle of which arises a trumpet-shaped tube, and a lesser simple one.

PENIS. The shell of this is round, straight, taper, with a dilated radiate larger extremity; the disk is covered with cylindrical pores. This is denominated the *watering-pot*. It is found chiefly in the Indian ocean. The shell is white or cinereous, with a faint shade of red; smoothish, tapering, and open at the small end; the dilated margin at the larger end

SERPULA.

end terminating in numerous small tubes; the disk is convex, and covered with round perforations, with a longitudinal one in the middle.

ECHINATA. Shell roundish, flexuous, rosy, with numerous rows of prickles, obtuse at the end. It is the size of a crow's quill; the aperture is margined.

OCREA. The shell of this is roundish, striate, brown. It inhabits the Indian ocean, usually affixed to corals.

PROTENZA. Shell polished, smoothish, with annulate plaits, a little tapering towards the end. It is found in the Indian and American seas, and is the size of a quill. The shell is ivory, whitish or blueish, either straight or partly bent.

DECUSSATA. Shell round, with decussate striæ, slightly wrinkled, flexuous, red, within smooth and white.

PROBOSCIDEA. The shell is smooth and white; the broader part is straight and transversely plaited. The shell is from two to four inches long, white, or of a dusky brown.

AFRA. Shell sub-striate, yellowish-brown, round, twisted into three whorls, with a central tip. It is found about the coasts of the island of Goree.

CEREOLUS. Shell round, smooth, yellowish, many times twisted. It inhabits America. The shell is long and narrow.

CORNUCOPIÆ. Shell conic, spirally twisted, yellowish, with brown bands; the middle is round and twisted; the aperture is orbicular. The shell, as to its form, is obtuse at the tip.

GOREENSIS. The shell is round, cancellate, yellow, within horny. It is found at Goree, fixed to testaceous substances and wood; is from eight to nine inches long, with elevated striæ; the longitudinal ones are crowded.

INTESTINALIS. Shell triangular, twisted, fragile, tuberculate, with hollow dots. This is found on the African coast. The shell is whitish, singularly twisted, sub-umbilicate, within glabrous.

INFUNDIBULUM. The shell is round, white, transversely striate, and thrice twisted; the first bend appearing as if composed of five funnels placed on each other.

PYRAMIDALIS. Shell cinereous, above convex, beneath flat, pyramidal, hence its specific name, and it is many times twisted, the bends decreasing inwardly. It is found in the Indian sea, adhering to testaceous substances about an inch long, open at the narrower end; sometimes it is straightish, or a little bent.

DENTICULATA. The shell of this is white, round, subulate, straight, toothed at the sides, with a longitudinal glabrous rib in the middle; the tip is a little incurved and glabrous. It is found adhering to the *Lepas tintinnabulum*, and is about three-quarters of an inch long.

MELITENSIS. Shell roundish, twisted, umbilicate, with decussate striæ, and longitudinal nodulous ribs, within smooth, with numerous divisions. It is found fossil in Malta. The two first bends are placed on each other.

NORWEGICA. The shell of this is round, smooth, incurved, with a nearly obsolete undulate base: the mouth is obliquely truncate. It is found, as its specific name denotes, in Norway.

PORRECTA. Shell round, smooth, polished, ascending in a flexuous manner from the spiral base. It inhabits the North seas. The shell resembles the *S. spirillum*, but is whiter, pellucid, and not rugged; the inhabitant is short, with a red back and paler sides.

VITREA. The shell is round, regular, spiral, orbicular, pellucid, shining, wrinkled, with a thickened aperture. This

species is found in the Greenland seas, on *fertulariæ*, fuci, stones, and divers marine substances. It resembles the *S. glomerata*; the shell is thick, umbilicate, not a line in diameter, and sometimes it is of a reddish colour.

CANCELLATA. Shell spiral, glomerate, with three grooves, the lower groove interrupted by transverse lines. It inhabits the Greenland seas, and resembles the *S. granulata*. Shell white, grey or greenish, the aperture is two-toothed.

STELLARIS. Shell sub-orbicular, umbilicate, convex, radiate with wrinkles. This also is found in the Greenland seas, on *fertulariæ* and stones. The shell is scarcely larger than a needle, violet, reddish-brown, or yellowish radiate with white; beneath it is flat, with a single whorl or bend; the aperture is very minute.

GIGANTEA. The shell of this is somewhat triangular, with a little bend, gradually tapering, violet, within smooth, pale yellow, the aperture is white, with undulate striæ, and armed with a conic tooth. It inhabits Africa and America, attached to rocks and corals. The shell is six inches high, and as thick as the little finger. The inhabitant is whitish.

CINEREA. The shell is filiform, glabrous, conglomerate, perforated. It inhabits the shores of Massilia; it is glabrous, of a greyish-white, and flexuous.

* **SULCATA.** Shell with two whorls, deeply and spirally grooved. It inhabits the coasts of Pembroke-shire, on the roots of the *Fucus digitatus*. It is a minute shell, of a greenish colour.

* **OVALIS.** Shell sub-oval, imperforated. It is found at Tenby. The shell has two bends, which form an oval; it is never perforated, and is minute.

* **REFLEXA.** The shell is regular, rounded, with a reflected margin at the aperture. This is found on the Pembroke-shire sands. It is minute; shell glossy, white, perforated; the aperture is above the plane of the spire.

* **CORNEA.** The shell is regular, rounded, and pellucid, with three whorls. This also is an inhabitant on the Pembroke-shire coast. It is brown and horny.

* **BICORNIS.** Shell femilunar, ventricose, white, opaque, glossy. It is found at Sandwich and Reculver, and is minute.

* **PERFORATA.** Shell femilunar, perforated, white, opaque, glossy. It inhabits Sandwich, as do all those that will be hereafter described. This is, however, as well as the next, very rare and minute.

* **LACTEA.** The shell is ovate, thin, smooth, pellucid, with milky veins.

* **LAGENA.** Shell rounded, striate, grooved, with a narrow neck. This is described, as are all those which are found in this country, in Adams's work on the Microscope. The shell of this is exactly shaped like an oil-flask, and is whitish.

* **RETORTA.** Shell rounded, margined, with a slender recurved neck. The shell is white, opaque, shaped something like the retort used by chemists.

INCURVATA. The shell is straight, with three close whorls at the smaller end. The shell is white and transparent, and resembles, in some respects, the *Nautilus femilunus*.

SERPYPILLUM, in *Botany*, sometimes written *Serpillum*, so called from its humble creeping mode of growth. See **THYMUS**.

SERQUEUX, in *Geography*, a town of France, in the department of the Upper Marne; 3 miles N. of Bourbonne.

SERRA,

SERRA, PAOLO, in *Biography*, author of an elaborate treatise on solmifation, published at Rome in 1768, small folio, entitled "Introduzione Armonica Sopra la nuova ferie de' Suoni modulati oggidì, e modo di rettamente, e piu facilmente intonarla;" or, "Harmonical Introduction to a new series of modulated sounds, and a method for accurately, and with greater facility, learning to name and produce them with the voice."

The author begins, cap. 1, with the origin of music, its utility, and the different modes of naming the notes in singing. After endeavouring to rob Guido of the invention of the hexachords and solmifation, and condemning its use, he proposes a new method of naming the notes in learning to sing; assigning a specific name to every found in the scale ending with the vowels A, E, I; as *ca* for a flat note, *ce* for a natural note, and *ci* for a sharp note; beginning each found with the letters now in use in the Septenary, by which means the student is disembarassed from all mutations, and every found in the scale has a specific and invariable name appropriated to it.



This method had the approbation of several of the best masters in Rome, who have signed a certificate of its effect upon the studies of a young finger of the name of Benedetti, who was rendered capable by it, in less than a year, of singing at sight any vocal music that was put before him, even without accompaniment. Benedetti has since sung the first man's part in the operas of several of the principal cities of Italy; and, perhaps, his genius may be such, as would have enabled him to have done the same by any other method, with equal study and practice. Instrumental performers, at present, are not plagued with the ancient names of the notes and mutations, but learn them by the simple letters of the alphabet; and yet we have never heard of one that has been able to play at sight in a year's time.

Upon the whole, the alphabetic names of the notes seem the most simple and useful for every purpose but that of exercising the voice, which is best done by the vowels; and it may be said, that to *syllabize* in quick passages is little more than to speak, but to *vocalize* is to sing. However, we were told by a scholar of the famous Durante, that while he was in the conservatorio of St. Onofrio, at Naples, when the boys used to be tormenting themselves about the mutations, and the names of notes in transposed keys, with double flats and sharps, Durante cried out, "Queste note intonatele, chiamatele poi anche diavole se volete, ma intonatele." Meaning, that if they did but hit the intervals right, and in tune, he did not care what they were called. And, perhaps, what Pope says of different forms of government, may be more justly applied to these several methods of singing.

"Whate'er is best administer'd is best."

As, in the use of any of them, whoever has the best master,

and seconds his instructions with the greatest degree of intelligence and industry, will be the most likely to succeed. And when we recollect the great abilities and enchanting powers of many fingers of past times, who have been obliged to articulate every note of their *solfeggi* in the most rapid movements, we may apply to the new systems what M. Rouffleau said with respect to his own: "That the public has done very wisely to reject them, and to send their authors to the land of vain speculations." For innovators will always find, that a bad method, already known, will be preferred to a good method that is to learn.

SERRA, in *Botany*, a genus of plants, so called in the *Flora Peruviana*, after a Spanish botanist of the same name, who has studied the plants of Minorca. *De Theis*.

SERRA, in *Geography*, a town of France, in the department of the Jemappe, and chief place of a canton, in the district of Corté. The canton contains 2171 inhabitants.

SERRA, a town of Corsica; 11 miles S.S.W. of Cervione.

SERRA de Azenhao, mountains of Portugal, in Alentejo; 4 miles N. of Monfort.

SERRA d'Alcoba, mountains of Portugal, in the province of Beira, between Viseu and Bragança Nova.

SERRA de Bouzeno, mountains of Portugal, in Alentejo; 4 miles S. of Portalegre.

SERRA de Culdeirao, mountains of Portugal, between Algarva and Alentejo.

SERRA da Estrica, mountains of Portugal, in the province of Entre Duero e Minho; 18 miles N. of Braganza.

SERRA Falperra, a town of Portugal, in Tras los Montes; 15 miles W. of Mirandela.

SERRA de Maram, a mountain of Portugal, in the province of Tras los Montes; 10 miles S. of Chaves.

SERRA de Monchique, mountains of Portugal, between Alentejo and Algarva.

SERRA de Momil, mountains of Portugal, between Mirandela and Torre de Moncorvo.

SERRA de Querrera, a town of Africa, in Lower Guinea, on the river Camarones.

SERRA de Reboardaos, mountains of Portugal, south of Braganza, in Tras los Montes.

SERRA de St. Miguel, mountains of Portugal, in Alentejo, on the south side of the Tagus; 15 miles N.N.W. of Castello de Vide.

SERRA de Salvador, mountains of Portugal, in Alentejo; 8 miles E. of Arronches.

SERRA Piscis, in *Ichthyology*, a name given by many authors to the *pristis*, or *saw-fish*.

SERRA is also a name given by Pliny to a species of the balistes, called by the generality of writers *scelopax*. It is distinguished by Artedi by the name of the balistes, with two spines in the place of the belly-fins, and one behind the anus. See TRUMPET-fish.

SERRAE, in *Geography*, a town of European Turkey, in Macedonia, the see of a Greek archbishop; 36 miles E.N.E. of Saloniki.

SERRAIN, a town of Arabia, in the province of Hedsjas; 40 miles S.W. of Mecca. N. lat. 21° 5'.

SERRANA, or *Pearl Island*, a small island in the Caribbean sea, so called from Serrana, the commander of a Spanish vessel in the time of Charles V., who was shipwrecked on the coast. N. lat. 14° 5'. W. long. 78° 50'.

SERRANILLA ISLANDS, a cluster of small islands in the bay of Honduras. N. lat. 16° 10'. W. long. 80° 10'.

SERRAPETRONA, a town of Italy; 7 miles S.W. of Ancona.

SERRATA, a name given by some of the Roman authors to the plant which the Gauls, according to Pliny, had named *betonica*, and which the Greeks called *cestrum-psuchrotrophon* and *priorites*. This was evidently the same plant with our *ferratula*, or saw-wort; but besides this there was another plant called by this name, and which, according to Pliny, was the *chamædrys* or germander of the Greeks.

Dioscorides says nothing of the *chamædrys*, but that its leaves were small. And it is much more probable, that the world should take the idea of a saw from the leaves of the *ferratula* than from those of this plant, they being much less nicely denticulated than those. So that those who have been influenced by Pliny, to suppose the germander and *ferrata* of the ancients to be the same plant, are in the wrong, though they have the countenance of this so generally reputed authentic author for it.

SERRATE FLIES, in *Natural History*, a name given by authors to certain flies, distinguished from all the other kinds by their having a weapon resembling a double saw, placed at the hinder part of the body; this serves several species of them to make holes in the branches of trees, in which they deposit their eggs; but there are some of them which do not seem to make any use of this curious instrument, though they have it. See *ROSE-FLY*.

The fly of this kind that lays its eggs on the gooseberry-bush, deposits them only on the surface of the middle rib of the leaf; and the osier-fly, which is one of this genus, produced from a bastard caterpillar of the osier, lays its eggs on the intermediate surface of the leaves between the ribs.

There appears to be no use made of this curious instrument in the depositing of these eggs, since they are only laid in rows upon the leaves, and fixed to them by means of a viscous fluid which covers them. It is a very remarkable property in the eggs of this genus of flies, that they grow much larger after they are laid. This is observable in the eggs of the common rose-fly, which are at first buried in the wood, and by their growth force out the surface into tumours of an oval figure; but in those of the osier-fly it is most beautifully seen, and the whole growth of the fœtus in them is clearly seen, on examining them at different times of their growth, which may be easily done without disturbing them, as they lie naked on the surface of the leaf.

There seems a plain proof that the egg receives some sort of benefit, and that a very essential one to its preservation, from the juices of the plant on which it is deposited, since, if those leaves be pulled off from the plant, and left to dry, the eggs always dry up with them, and perish; whereas, if the ends of these leaves be put into water, and the leaf be by that means preserved fresh and juicy, the creature hatches from it as well as if it was left upon the tree. Reaumur's Hist. Inf. vol. ix. p. 164.

SERRATED LEAF, in *Botany*. See *LEAF*.

SERRATI, in the *History of Coinage*, a name anciently given to Syrian, Roman consular, and some few other coins, which were ornamented by cutting out regular notches on the edges. Tacitus says, that the Germans preferred these to other Roman coins. But the old forgers imitated this kind of incision, which was intended to prevent forgery, by shewing the inside of the metal.

SERRATULA, in *Botany*, so called by the early writers on plants, from the fine serratures of the leaves, in the original species, which stands first on our list.—Bauh. Pin. 235. Linn. Gen. 408. Schreb. 542. Willd. Sp. Pl. v. 3. 1638. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 845. Prodr. Fl. Græc. Sibth. v. 2. 148. Ait. Hort. Kew. v. 4. 472. Dill. Giff. t. 8. Juss. 174. Lamarck Illustr. t. 666. f. 1. Gært. t. 162.—Class and order, *Syngenesia*

VOL. XXXII.

Polygamia-aqualis. Nat. Ord. *Compositæ capitata*, Linn. *Cinara-cephala*, Juss.

Gen. Ch. *Common Calyx* oblong, nearly cylindrical, closely imbricated, with numerous, lanceolate, erect, unarmed scales. *Cor.* compound, tubular, uniform. Florets numerous, equal, all perfect, of one petal, funnel-shaped; the tube inflexed; limb tumid, five-cleft. *Stam.* Filaments five, capillary, very short; anthers united into a cylindrical tube. *Pist.* Germen obovate; style thread-shaped, the length of the stamens; stigmas two, oblong, revolute. *Peric.* none, except the unchanged calyx. *Seeds* solitary, obovate. Down sessile, toothed or feathery. *Recept.* chaffy or hairy.

Ess. Ch. Receptacle chaffy or hairy. Calyx imbricated, cylindrical, unarmed. Seed-down feathery or toothed.

Obs. *Carduus* and *Cnicus* are distinguished from this genus by their more swelling, or nearly globose, calyx, with spinous scales. We know not what Gærtner has procured for the *Carduus cyanoides*, which he represents with unarmed scales, and therefore properly refers to *Serratula*; but the true Linnæan plant has spinous scales. This learned author would remove to the present genus a number of species from *Cnicus*, *Carduus*, and *Centaurea*, of which he names but two, *Cnicus centauroides*, and *Centaurea Rhaponticum*, certainly very remarkable plants, and strictly akin, but in our opinion they answer very imperfectly to the idea of a *Serratula*. We content ourselves with following Willdenow in the main, though well aware of the ambiguity of some of the species, too prone to approach *Carduus* in their calyx, or *Centaurea* occasionally in their marginal florets. We persist, however, in excluding *S. arvensis*, which is, in character and habit, a most evident and certain *Carduus*, or rather *Cnicus*, as Mr. Curtis long ago demonstrated. Willdenow could scarcely have been acquainted with this common species, for he marks it as biennial, though no weed is more notorious for its deeply creeping, almost indestructible, roots. See Fl. Brit. 851, and Curt. Lond. fasc. 6. t. 57.—Two genera, with a naked receptacle, and other differences of character, are properly separated by Schreber, Willdenow, and others, from *Serratula*. See *LIATRIS* and *VERNONIA*.

1. *S. tinctoria*. Common Saw-wort. Linn. Sp. Pl. 1144. Willd. n. 1. Fl. Brit. n. 1. Ait. n. 1. Fl. Dan. t. 281. Engl. Bot. t. 38. (*Serratula*; Ger. Em. 713. Matth. Valgr. v. 2. 295. Camer. Epit. 682.)—Leaves sharply serrated, somewhat ciliated, more or less pinnatifid at the lower part. Corymb level-topped. Florets uniform. Seed-down fringed.—Native of groves and bushy places, chiefly in the north of Europe; though the Abbé Seftini told Dr. Sibthorp he had gathered this plant near Constantinople. It is perennial, with a brown woody root, and flowers in July and August. The stem is upright, straight, stiff, leafy, angular, reddish, about two feet high, not much branched. Leaves alternate, smooth, of a deep shining green, with elegant, sharp, hair-pointed teeth; the radical ones stalked, undivided; the rest lyrate, or variously pinnatifid. Flowers corymbose. Calyx purplish-brown, now and then downy. Corolla crimson, occasionally white. This herb serves in Sweden to give a yellow colour to coarse woollen cloth.

2. *S. coronata*. Siberian Saw-wort. Linn. Sp. Pl. 1144. Ait. n. 2. (*S. præalta centauroides montana italica*; Bocc. Musc. 45. t. 37? *Carduus* n. 41; Gmel. Sib. v. 2. 49. t. 20.)—Leaves sharply serrated, somewhat ciliated, deeply pinnatifid. Corymb level-topped. Florets of the circumference female, longer than the rest.—Native of most parts of Siberia, flowering in the end of June. If Boccone's synonym be right, the plant grows also on mountains in

R r

Italy.

SERRATULA.

Italy. Gmelin says it is used in the former country for dyeing yellow, birch-leaves being superadded. This species is thrice as large as the *tinctoria*; the *leaves* always deeply pinnatifid; the *flowers* much larger, furnished with radiating marginal florets, which, though destitute of *stamens*, produce *seed*.

3. *S. quinquefolia*. Five-leaved Saw-wort. Willd. n. 3. Ait. n. 3.—Leaves serrated, deeply pinnatifid, five or seven-lobed. Flowers simply corymbose. Inner scales of the calyx elongated and coloured.—Native of the north of Persia. Introduced into the gardens of England by Mr. Buxh, in 1804. A hardy perennial, flowering in July and August. Very like the last, but the *leaves* have only two or three pair of lobes; the *calyx* is rather smaller, and not downy, its long coloured inner scales resembling a radiant *corolla*. *Florets* uniform. *Willdenow*. The specific name is exceptional, for, by this author's own account, the *leaves* are only pinnatifid.

4. *S. humilis*. Humble Saw-wort. Desfont. Atlant. v. 2. 244. t. 220. Willd. n. 4. (*Jacea supina*, *carlinæ capitulo acaule*, *tota incana*; Bocc. Mus. 146? *J. incana chamaeleonis capitulo*; *ibid.* t. 109?)—Leaves pinnatifid, with oblong entire segments; downy beneath. Flower solitary. Calyx hoary, with spreading-pointed scales.—Native of Sicily and Barbary, flowering in summer. An elegant little perennial plant, with several spreading radical *leaves*, either simply or interruptedly, but always very deeply, pinnatifid; smooth above. *Flower* rose-coloured. Its *stalk* appears to vary in length, being sometimes nearly wanting.

5. *S. mollis*. Soft-leaved Saw-wort. Cavan. Ic. v. 1. 62. t. 90. f. 1. Willd. n. 5.—Leaves pinnatifid, with oblong, obtuse, entire segments; downy beneath. Flower solitary. Calyx downy, with erect scales.—Native of hills in Spain, flowering in June. Cavanilles says the root is annual, but Willdenow thought it seemed perennial. The latter, who had seen dried specimens of this and the last, was persuaded of their being distinct, and, besides the characters given above, he remarks that the *seed-down* of the present species is most feathery.

6. *S. pygmaea*. Dwarf Linear Saw-wort. Jacq. Auftr. v. 5. 20. t. 440. Willd. n. 6. (*Cnicus pygmaeus*; Linn. Sp. Pl. 1156.)—Leaves nearly linear, revolute, loosely hairy. Stem leafy, hairy, single-flowered. Calyx-scales ovato-lanceolate, erect.—Found by Jacquin on the celebrated Austrian mountain called *Schneeberg*, in 1761. Clusius appears to have gathered the same in Hungary, and Scopoli in Carniola. The perennial root, furnished with long black fibres, is crowned with a tuft of numerous spreading *leaves*, each two or three inches long, not half an inch wide, green on both sides, though clothed with loose scattered white hairs; their margin either entire, or distantly toothed. Similar, though rather shorter, *leaves* clothe the simple *stem*, which is from two to five inches high, hollow, hairy, bearing one upright purplish *flower*, with prominent violet *anthers*. The scales of the *calyx* are broad, flat, purplish and downy. This is one of the rarest alpine plants, nearly related to the following, but certainly distinct.

7. *S. alpina*. Alpine Saw-wort. Linn. Sp. Pl. 1145. Willd. n. 7. Fl. Brit. n. 2. Engl. Bot. t. 599. Lightf. Scot. 448. t. 19. (*Cirsium montanum humile*, *cynoglossæ folio*, *polyanthemum*; Dill. Elth. 82. t. 70.)

8. *S. discolor*. Willd. n. 8. (*Cirsium* n. 179; Hall. Hist. v. 1. 77. t. 6. C. n. 52; Gmel. Sib. v. 2. 67. t. 26, Herb. Linn. from the author. *Carduus mollis*, *foliis lappathi*; Ger Em. 1184.)

Leaves cottony and white beneath, toothed, pointed, ovato-lanceolate, undivided; the radical ones somewhat ovate or heart-shaped. Flowers corymbose. Calyx clothed with soft hairs.—Native of the highest mountains of Europe, particularly Siberia, Wales, Scotland, and Switzerland, flowering in July and August. There can be no doubt that all the synonyms here cited belong to one species, nor is it easy to mark the limits of even its varieties. The root is perennial, tough, and woody. *Stem* from three to twelve inches, or more, in height, simple, leafy, striated, cottony, crowned with a level-topped tuft of elegant *flowers*, on stalks of various lengths. *Calyx* of many soft, brown, hairy scales. *Florets* pink, with blue or violet anthers. The *leaves* are excessively variable in shape, from lanceolate to broadly heart-shaped; their margin toothed, sometimes wavy; their *footstalks* long and slender, short and thick, or altogether wanting. The upper surface of each *leaf* is green, smooth, and nearly or quite naked; the under covered with dense, white, cottony down. The narrowest-leaved specimens grow in rich ground, amongst other plants.

8. *S. angustifolia*. Narrow-leaved Saw-wort. Willd. n. 9. (*S. alpina* ♂, *angustifolia*; Linn. Sp. Pl. 1145. *Cirsium* n. 59; Gmel. Sib. v. 2. 78. t. 33. Herb. Linn. from the author.)—Leaves linear, revolute, entire; rather hairy beneath. Flowers somewhat racemose. Bractæas awl-shaped.—Gathered by Steller, on the banks of rivers in the eastern part of Siberia. A much more slender plant than any variety of the preceding. The *stem* is eighteen to twenty-four inches high, erect, slender, hollow, striated, purplish, nearly smooth. *Leaves* scattered, hardly a line broad, quite entire, paler, and a little hairy, but not cottony, beneath. *Flowers* few, on long, simple, distant, rather racemose than corymbose, stalks. Scales of the *calyx* ovate, pointed, purplish or brown, hairy within.

9. *S. salicifolia*. Willow-leaved Saw-wort. Linn. Sp. Pl. 1145. Willd. n. 10. Ait. n. 5. (*Cirsium* n. 53; Gmel. Sib. v. 2. 69. t. 27.)—Leaves linear-lanceolate, entire; white and cottony beneath. Corymb compound, leafy. Scales of the calyx elliptical, ribbed, downy.—Native of Siberia, in dry open rocky places, where it flowers towards the end of July. Mr. Joseph Buxh is said to have brought this species into the English gardens in 1796. It is an elegant hardy perennial, distinguished by the snowy whiteness of the backs of its *leaves*, whose edges are scarcely, if at all, revolute; their base tapering down into a bordered *footstalk*. The *flowers* rather more resemble those of *S. tinctoria* than of *alpina*, but the *calyx* is slightly cottony.

10. *S. indica*. Indian Saw-wort. Willd. n. 11.—“Leaves linear-lanceolate, serrated, roughish. Stem panicled. Corymbs level-topped.”—Native of the East Indies. *Stem* furrowed, smooth, four feet high. Upper *leaves* entire. *Corymbs* terminating the branches. *Calyx* cylindrical, with lanceolate, scarious, imbricated scales. *Seed-down* chaffy, lanceolate, ciliated. *Receptacle* clothed with lanceolate, acute, serrated, chaffy scales. *Willdenow*.

11. *S. multiflora*. Many flowered Saw-wort. Linn. Sp. Pl. 1145. Willd. n. 12. (*Cirsium* n. 54; Gmel. Sib. v. 2. 71. t. 28.)—Leaves lanceolate, rough, somewhat decurrent, nearly entire; woolly beneath. Stem repeatedly corymbose, many-flowered. Scales of the calyx lanceolate, keeled.—Gathered by Gmelin in mountainous parts of Siberia. Dr. Fischer has sent us a less luxuriant specimen from mount Caucasus. The *stems* are said to be decumbent. The *leaves* vary in breadth, and are sometimes revolute; the radical ones coarsely toothed. Their green upper surface is rough like a file;

le; the under clothed with loose white cottony wool. *Flowers* more or less numerous, corymbose, rose-coloured, with an elegant, slender, purplish, lightly downy, *calyx*. Gmelin himself justly says that the *flowers* in his plate are too large; yet Linnæus on that account doubts the certainty of his synonym, for which there can be no reason.

12. *S. caspica*. Caspian Saw-wort. "Pall. It. v. 2. append. n. 121. t. Z." Willd. n. 13.—"Leaves lanceolate, obtuse, entire, smooth, somewhat fleshy. Stem corymbose."—Native of the borders of the Caspian sea. The *seed-down* is hairy and fringed. *Receptacle* villous. Willdenow.

13. *S. mucronata*. Pointed-scaled Saw-wort. Desfont. Atlant. v. 2. 243. t. 219. Willd. n. 14.—Leaves elliptic-oblong, nearly entire, smooth. Stem with few flowers. Scales of the calyx with recurved membranous points.—Found by Desfontaines, on hills in Barbary near Mafcar, and on mount Atlas, flowering in the early spring. *Root* perennial. Whole *plant* very smooth, near two feet high. *Leaves* alternate, entire or finely toothed, from four to six inches long. *Flowers* from one to three, rather large, pink, or purplish, with an ovate squarrose *calyx*. *Seed-down* and hairs of the *receptacle* simple, slender.

14. *S. amara*. Bitter Saw-wort. Linn. Sp. Pl. 1148. Willd. n. 15. (Cirsium n. 55; Gmel. Sib. v. 2. 72. t. 29.)—Leaves lanceolate, rough-edged, naked, somewhat decurrent. *Flowers* corymbose. Scales of the calyx dilated and rounded at the extremity.—Native of dry open fields in Siberia, on a saline soil, abundantly. Gmelin. *Root* as thick as the little finger, perennial, bitter, with a saline flavour. *Stem* from a span to one or two cubits high, simple or branched, leafy, angular, and furrowed. *Leaves* four or five inches long, and one broad, coriaceous, tapering at each end, naked and nearly smooth on both sides, except the edges and midrib: the lower ones stalked, toothed; the upper generally decurrent, and entire. *Flowers* several, purple, the size of *Centaurea nigra* or *Jacea*, but in the aspect and hue of their *calyx* most resembling the latter, except that the round apex of each scale, though jagged, is not fringed.

15. *S. centauroides*. Centaury-like Saw-wort. Linn. Sp. Pl. 1148. Willd. n. 16. Ait. n. 6. (Carduus n. 38; Gmel. Sib. v. 2. 44. t. 17.)—Leaves deeply pinnatifid, acute, smooth, unarmed. Stem branched. *Flowers* solitary. Scales of the calyx partly pointed; the inner ones dilated and membranous.—Native of Siberia. Sent by Sir Joseph Banks to Kew, in 1804. A hardy perennial, flowering in July and August. This has the habit of several *Centaurea*, but wants the neuter marginal florets. The *stem* is a foot or more in height, alternately branched, leafy, angular, smooth. *Leaves* rigid or coriaceous, with deep, entire, decurrent segments. *Flowers* solitary at the top of each branch, large, purple. *Calyx* ovate, of many ovate acute scales, several of the middlemost of which bear a short spine, while the inner ones are much elongated into a linear, membranous-tipped appendage. The genus of this plant cannot but be considered as very doubtful, nor can we refer it without scruple to *Serratula*, or *Centaurea*; perhaps we should, like Gmelin, remove it to *Carduus* or *Cnicus*, the *calyx* answering very nearly to that of the *arvensis*.

16. *S. japonica*. Japan Saw-wort. Thunb. Jap. 305. Willd. n. 17.—Leaves pinnatifid, toothed, rough on both sides. *Corymb* compound. Scales of the calyx dilated and rounded at the extremity. Gathered by Thunberg in Japan. The *stem* is a yard high, scarcely branched, leafy, strongly angular and furrowed, rough with minute hairs. *Leaves* stalked, somewhat lyrate, three or four inches long. *Flowers*

numerous, in a compound level-topped corymb, rather smaller than those of *Serratula arvensis*. *Calyx-scales* tipped with an elegant, purple, notched, membranous dilatation.

17. *S. ciliata*. Fringed Saw-wort. Vahl. Syn. b. v. 1. 67. Willd. n. 18.—Leaves sessile, lanceolate, undivided, fringed with minute spines; downy underneath.—Gathered by Forskall, in gardens at the village of Bujuchtari, near Constantinople. Willdenow erroneously makes this species a native of Egypt. Forskall took it for the Linnæan *S. arvensis*. Vahl, who had examined his original specimens, describes the *stem* as herbaceous, branched, striated; hoary in the upper part. *Leaves* sessile, an inch and a half long, tapering at the base, obtuse, finely serrated, with spinous teeth; the upper side green, shaggy; the under hoary and downy. *Flowers* smaller than a hazel-nut, stalked, two or three at the end of each branch. *Calyx-scales* smooth; the outermost ovate, keeled at the summit, and pointed; the inner ones lanceolate. *Seed-down* feathery. This may possibly, like the following, belong to *Cnicus*.

18. *S. fetosa*. Bristly Saw-wort. Willd. n. 19.—"Leaves oblong, smooth, finely serrated, fringed with bristles, obtuse, pointed. Stem corymbose."—Native of Silesia; observed by the Rev. Mr. Seeliger. *Root* biennial. *Stem* furrowed, smooth, corymbose and level-topped. *Leaves* copious, alternate, an inch long (or broad?) green on both sides, smooth, undivided, very minutely serrated, each serrature tipped with a bristly point. *Flower-stalks* hoary. *Calyx* slightly downy, with ovate, acute, obscurely-pointed scales. Willdenow, from whom we borrow this description, says the plant is like *Cnicus* (his *Serratula arvensis*, except in the form of its *leaves*, and smallness of the *flowers*. If so, it perhaps is likewise a real *Cnicus*, and perennial; see our observations under the generic character.

SERRATULA, in *Gardening*, contains plants of the tall, hardy, herbaceous, perennial kind, of which the species cultivated are; the long-leaved saw-wort (*S. noveboracensis*); the tall saw-wort (*S. præalta*); the glaucous-leaved saw-wort (*S. glauca*); the rough-headed saw-wort (*S. squarrosa*); the ragged-cupped saw-wort (*S. scariosa*); and the spiked saw-wort (*S. spicata*).

Method of Culture.—These plants may all be increased by parting the roots, and planting them out in the autumn, when the stems decay, or in the spring; but the former is the better season. The old plants should not be parted oftener than every third year, and then not too small.

They are likewise all capable of being increased by seeds, when they can be had good, which should be sown in the autumn or early spring, in a border to the east, in slight drills. When the plants are a few inches high, they should be pricked out in nursery-rows to remain till the following autumn, and then planted out where they are to remain.

They afford ornament in the borders, clumps, &c. being planted to the middle or the back parts.

SERRATUM, and SERRULATUM, *Folium*, in *Botany*, so called from *ferra*, a saw, the teeth of which are imitated in their margins. See LEAF.

SERRATUS, in *Anatomy*, a name given to different muscles attached to the ribs, and arising by several distinct portions, so as to have a serrated edge. In French they are called *dentelés*.

SERRATUS *Anticus*, the name under which Albinus describes the pectoralis minor. It is also called *ferratus minor anticus*.

SERRATUS *Magnus*, (*ferratus major anticus*; le grand *dentelé*; scapulo costien,) a large muscle of the shoulder, broad and flat, lying between the scapula and the chest, and extending

extending from the nine upper ribs to the basis of the scapula. It is irregularly four-sided, broader below and in front than above and behind. It arises from the eight or nine upper ribs by as many distinct pointed portions, which are first tendinous, then fleshy. The first, which is broad, very thick, short, and distinct from the rest, arises from the outer edge of the first rib, towards its back part, from the second, and from an intermediate aponeurosis. The second, third, and fourth, broad and thin, arise from the external surfaces of the second, third, and fourth ribs, in oblique lines directed from above and behind, downwards and forwards. The four or five last, narrower and increasing in length downwards, arise from the upper edge and external surface of the corresponding ribs, and are placed between the digitations of the obliquus externus abdominis. From the origins just enumerated, the fibres of the muscle proceed, divided, particularly below, into fasciculi corresponding to each digitation, separated by cellular lines, and soon forming three distinct portions. The superior division is thick, narrow, and short, extends from the two first ribs to the superior angle of the scapula, ascending a little, and covering the upper edge of the second portion, to which it is united. The middle division, broad and thin, goes from the second, third, and fourth ribs to the upper three-fourths of the basis of the scapula; its fibres proceed horizontally from before backwards, except the inferior ones, which descend a little. The inferior portion of the muscle passes from the fifth, sixth, seventh, and eighth ribs to the inferior fourth of the basis of the scapula, and the inferior angle of the bone. This part is thick, radiated, broad in front, and narrow behind. The superior fibres of this portion go nearly horizontally from before backwards; the inferior ones are directed at the same time from below upwards, and are more oblique in proportion as they are lower: they are united towards the inferior angle of the bone.

The external surface of the serratus is covered, towards its lower and anterior part, by the skin, at the lower and posterior part by the latissimus dorsi. Above and towards the front it is covered by the pectoral muscles, by the axillary vessels, and the brachial plexus. In the rest of its extent it is in contact with the sub-scapularis. The external surface covers the seven or eight superior ribs, the external intercostal muscles, and behind a portion of the serratus superior posticus. The upper edge of the muscle is the shortest, extending from the margin of the first rib to the superior angle of the scapula: the inferior, much longer, reaches from the eighth or ninth rib, or about two inches from its cartilage, obliquely to the inferior angle of the scapula. The anterior edge is the longest, and fixed to the external surface of the eight or nine first ribs, by the distinct pointed serræ or digitated portions, from which the name of the muscle has been derived: the posterior is fixed to the front edge of the basis of the scapula, and of the superior and inferior angles of the bone.

The action of the serratus anticus produces two different effects, according as the scapula or the ribs are the fixed point. In the first case, the scapula being fixed by the trapezius, rhomboid and levator muscles, it draws the ribs outwards, elevating those to which it is fixed by its lower digitations: in this respect it is a powerful agent of inspiration, concurring with the pectoral muscles. In the second case, it carries the scapula forwards, antagonizing the rhomboid, trapezius, &c. But it moreover draws the inferior angle forwards, and consequently moves the upper and anterior angle of the bone, forming the shoulder, upwards. Thus the serratus anticus is an important muscle in supporting

burdens carried on the shoulders. In this case the diaphragm and abdominal muscles are put in action to draw down the ribs, fix them, and prevent them from yielding to the efforts of the serratus.

SERRATUS Major Anticus. See *SERRATUS Anticus*.

SERRATUS Posticus Inferior, (dentelé postérieur inférieur; lombocostien,) is a broad, thin, and flat muscle, situated at the lower part of the back, and extending from the spinous processes of the vertebræ to the ribs. It arises from the spinous processes of the two last dorsal vertebræ, of the three first lumbar, and the intervening inter-spinal ligaments, by a broad aponeurosis, composing one half of the muscle, common to it and the latissimus dorsi, composed of parallel fibres, directed obliquely upwards and outwards. This aponeurosis is connected in front to that of the transversus abdominis, and by its lower edge to the obliquus internus. The muscular fibres, passing with the same obliquity as those of the aponeurosis, form four fasciculi or pointed serrated portions, of which the first and broadest is fixed to the lower edge, and near the angle of the second false rib; and the three others, which are successively smaller, are also attached, by aponeurotic fibres, to the lower edge of the three succeeding ribs, farther from the angle. The posterior surface of this muscle is covered by the latissimus dorsi. The anterior surface covers the three last false ribs, the external intercostal muscles, the longissimus dorsi and sacrolumbalis, and the transversus abdominis. The upper edge is continuous with the thin aponeurosis, which immediately covers the longissimus dorsi and sacrolumbalis.

By drawing downwards the lower ribs, this muscle assists in expiration. It cannot produce any effect on the spine: it will confine the muscles lying at the side of the spine, and thus has the same effect as the serratus posticus superior and the fascia extended between them.

SERRATUS Posticus Superior, (dentelé postérieur supérieur; dorsocostien,) is a very small and thin muscle, flat and four-sided, placed at the upper part of the back. It arises from the ligamentum nuchæ, the last cervical spinous process, and the two or three upper dorsal ones, by a thin aponeurosis, composed of parallel fibres, directed obliquely downwards and outwards. The fleshy fibres follow the same direction, forming a thin stratum, which terminates in four small fasciculi or serrated portions, ending in aponeurotic fibres, which are inserted in the upper edges of the second, third, fourth, and fifth ribs, near their angles. It is covered externally by the rhomboideus: and it covers the splenius, transversalis colli, the vertebral muscles, the ribs, and the corresponding intercostal muscles.

It will have the effect of elevating the ribs, and thereby of enlarging the chest, or assisting in inspiration.

SERRAVALLE, in *Geography*, a town of France, in the department of Marengo, on the Scrinia; 12 miles S. of Tortona.—Also, a town of France, in the department of the Sesia; 18 miles N. of Vercelli.—Also, a town of Italy, in the duchy of Mantua; 24 miles S.E. of Mantua.—Also, a town of Italy, in the Trevisan, $2\frac{1}{2}$ miles in circumference, partly on a plain between two mountains, and partly on the mountains near the river Maschio, which runs through the middle of the town, and has its source in a small lake in the higher part of the town. At the extremity of the marketplace is the public palace, and at the lower end the cathedral church, containing some good paintings. The town and its suburbs comprehend two parishes, and 30 churches, that of St. Augusta attracting notice by its noble architecture, and its long noble staircases. Here are also two monasteries, and two nunneries. The inhabitants are industrious, and trade particularly

particularly in cloth, woollen and silk manufactures, and carry on an extensive commerce in wine, corn, and honey, both with the adjacent provinces and with Germany; 2 miles N. of Ceneda.

SERRE, I. A., in *Biography*, a miniature painter of Geneva, who had been in England, and seemed well acquainted with Geminiani, and the state of music in our country in the middle of the last century. He has analysed the "Guida Armonica" of Geminiani, the "Basse fondamentale" of Rameau, and the Treatises of Tartini, with his discovery of the "Terzo Suono." These celebrated works M. Serre has critically examined in two ingenious essays, published in 1753 and 1763, in which there are likewise many curious remarks on disputable points in the theory and practice of harmony, which will both amuse and instruct musical students.

SERRÉ, Fr., close intervals in music, such as the enharmonic quarter tones in the ancient Greek music; and in French music, short and quick. See SPISUS.

SERRE, La, in *Geography*, a river which runs into the Oise, near La Fere, in the department of the Aisne.

SERRE, a town of France, in the department of the Isère; 12 miles N. of Romans.

SERRES, JOHN DE, in *Biography*, a Protestant minister, was born in the south of France, and studied at Lausanne. We find him in 1572, serving a country church in the neighbourhood of Geneva. Having made himself known by various works, he became rector of the college of Nîmes, and a minister of that city, and he was employed on several important occasions by Henry IV.; that prince having asked Serres if it were possible for a person to be saved in the communion of the church of Rome, he answered in the affirmative, whence he has been accused of promoting Henry's change of religion. Notwithstanding this decision, he was a warm controversialist against the Catholics, and made a very severe attack upon the Jesuits, entitled "Doctrinæ Jesuiticæ precipua capita." As a learned author, he is chiefly known by an edition of Plato in three volumes folio, printed by Henry Stephens in 1578, with notes and a new Latin version, which however is not remarkable for correctness; and the style of those parts which Serres composed is very unequal to the majesty of the original. He was author of a number of works in history, and had the title of historiographer of France; but his compositions are said by the Catholics to be partial and full of misrepresentations. The principal of them are as follow; "Commentariorum de statu Religionis et Reipublicæ in Regno Franciæ," comprising the events from 1557 to 1576: "Memoire de la Troisième Guerre civile sous Charles IX.;" "Recueil des Chose memorable avenues en France sous Henri II., François II., Charles IX., et Henri III.;" and "Inventaire General de l'Histoire de France." Serres, towards the end of his life, engaged in the hopeless design of uniting the Catholic and reformed churches, which brought on him the contempt of one party and the enmity of the other. He died in 1598.

SERRES, OLIVIER DE, an eminent agriculturist, was born in 1539, at Villeneuve de Berg, in the Vivarais. During the civil tumults of his time, his property was pillaged, and his house demolished, and after it had been rebuilt, it was again destroyed by fire. He is said to have borne these misfortunes with great equanimity, and to have forgotten them by engaging his mind in study and rural occupations. By his talents he became so advantageously known to Henry IV., that he sent for him to Paris, and employed himself in several improvements about his domains. Serres wrote works which rendered him the oracle of the cultivators in that age, and many of his ideas have been co-

pieced by later writers without acknowledgment. The chief of these, in which he collected the results of long experience, is entitled "Theatre d'Agriculture, et Menage des Champs," 1600, and has been several times reprinted. It has been described by Haller as "a great and valuable work, written by an experienced man, fond of simplicity, and not at all attached to expensive methods." Some of the economical precepts of Mr. Serres have been thrown into verse, in order that they might be more easily remembered. He published treatises on the management of silk-worms, the collection of the silk, and the culture of the white mulberry-tree, which he introduced into France. This estimable man died in 1619, at the age of four-score, after having had the satisfaction of witnessing the happy effects of the improvements suggested by him.

SERRES, in *Geography*, a town of France, in the department of the Higher Alps, and chief place of a canton, in the district of Gap; 24 miles W.S.W. of Gap. The place contains 1219, and the canton 4249 inhabitants, on a territory of 170 kilometres, in 10 communes. N. lat. 44° 26'. E. long. 5° 8'.

SERRET, a town of Asiatic Turkey, in Natolia; 30 miles W. of Castamena.

SERRIERES, a town of France, in the department of the Ardèche, and chief place of a canton, in the district of Tournon; 15 miles N. of Tournon. The place contains 1924, and the canton 9416 inhabitants, on a territory of 115 kilometres, in 17 communes.

SERRIS, a town of Hindoostan, in Bahar; 15 miles S.E. of Saferam. N. lat. 24° 51'. E. long. 84° 26'.

SERRO, a small island belonging to the cluster of Papuan isles. See PAPUA.

SERROPALPUS, in *Entomology*, a genus of insects, of the order Coleoptera, whose generic character is as follows: antennæ setaceous; four unequal feelers; the anterior ones are the longer, and deeply ferrate, composed of four joints, the last very large, truncate, compressed, patelliform; the posterior ones are subclavate; thorax margined, concealing the head, with a prominent angle on each side; the head is deflected; and the feet formed for digging. There are two

Species.

STRIATUS. The body of this insect is brown; the shells striate. It inhabits the island Runfale, and is described in the Stockholm Transactions for the year 1786; where it is said to be found chiefly on old wooden buildings, in the evening in autumn, and is about the size of the *Elaterrimus*.

LEVIGATUS. This species is characterized by a black body, and smooth shells. It inhabits different parts of Europe, and is likewise described in the volume of the Stockholm Transactions already referred to.

SERRURIA, in *Botany*, a name rightly altered by Mr. Salisbury and Mr. Brown, from the *Serraria* of professor John Burmann, who, in his *Plantæ Africanæ*, 266, establishes the latter appellation, in honour of Dr. Joseph Serrurier, Professor of Botany at Utrecht; but it is not easy to discover the above author's meaning in thus perverting the word; for *Serrurier* is a locksmith, and has no reference to a saw, or sawyer.—Brown. Tr. of Linn. Soc. v. 10. 112. Ait. Hort. Kew. v. 1. 198.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Aggregatæ*, Linn. *Proteaceæ*, Juss. Brown.

Eff. Ch. Corolla in four deep segments. Stamens in the concave tips of the segments. Nectary four scales beneath the

SERRURIA.

the germen. Stigma vertical, smooth. Nut superior, somewhat stalked. Common receptacle convex, many-flowered, with chaffy deciduous scales.

A genus of rigid Cape shrubs, of which Mr. Brown describes thirty-nine species, eight of which find a place in the Hortus Kewensis. The leaves are thread-shaped, pinnatifid or three-cleft, rarely undivided. Heads of flowers either terminal, or, from the bosoms of the uppermost leaves, either simple and solitary, or composed of several sessile partial heads, or corymbose. Bractæas imbricated, membranous, most commonly shorter than the flowers, in a few instances longer, in some wanting. Flowers always sessile, purple. *Pistil* the length of the corolla, with a club-shaped, rarely cylindrical, stigma. Nut oval, finely downy, sometimes bearded, sometimes nearly smooth. We select the following examples, among which are included all the species known in the gardens of England.

Sect. 1. *Heads simple; the flower-stalks undivided or wanting.*

S. pinnata. Wing-leaved Serruria. Brown. n. 8. Ait. n. 1. (Protea pinnata; Andr. Repof. t. 512.)—Heads stalked, somewhat aggregate. Bractæas lanceolate, villous, nearly as long as the flowers. Corolla bearded. Leaves pinnatifid or three-cleft, longer than the heads. Stem procumbent, hairy.—Gathered by Mr. Niven, on dry hills at the Cape of Good Hope, particularly in ascending Paarlberg. It flowered in Mr. Hibbert's garden, in the summer of 1807. In a natural state the stem is said to be perfectly prostrate, dividing from the base into branches about a foot long, round, downy, leafy. Leaves above an inch long, turned upwards, consisting of three or five awl-shaped segments. Heads of flowers red, about as big as a walnut, either solitary and terminal, or partly axillary; the young buds enveloped in the white silky hairs, which clothe the tips of the corolla externally.

S. cyanoides. Trifid-leaved Serruria. Brown. n. 10. Ait. n. 2. (Protea cyanoides; Linn. Mant. 188. Willd. Sp. Pl. v. 1. 507. Cyanus æthiopicus, rigidis capillaceis tenuissimis foliis trifidis; Pluk. Mant. 61. Phyt. t. 345. f. 6.)—Heads terminal, longer than their stalks. Bractæas roundish, pointed, villous. One segment of the corolla nearly smooth. Leaves spreading; the lower ones three-cleft; upper subdivided. Stem nearly upright.—Native of hills about the Cape. Mr. Brown gathered it on the sides of mountains, near Simon's bay. A shrub of humble growth, flowering with us in June or July. The branches are scarcely pubescent. Leaves not an inch long, rather hairy while young. Flower-stalks solitary, downy, generally but half the length of the heads of flowers, which are the size of a large cherry, rising above the upper leaves, and accompanied by membranous silky bractæas.

S. pedunculata. Woolly-headed Serruria. Brown. n. 13. Ait. n. 3. (Protea glomerata; Andr. Repof. t. 264.)—Heads terminal, stalked. Bractæas ovate, downy. Corolla curved, feathery; its inner segment silky. Leaves twice or thrice pinnatifid, hairy, as well as the upright stem.—Found in various hilly situations at the Cape of Good Hope, where the soil is rather fertile. Messrs. Lee and Kennedy are recorded as having first raised this species, in 1789, from seeds obtained from Vienna. It flowers in summer, and makes a handsome appearance, with its copious many-cleft leaves, and large heads of light reddish-brown flowers, clothed with fine white plumy down. The anthers are yellow. Stigma blackish.

S. hirsuta. Hairy Serruria. Brown. n. 15. (Protea phyllicoides; Thunb. Diff. n. 9. Prodr. 25. Willd. Sp. Pl. v. 1. 510, excluding the reference to Bergius.)—

Heads terminal, longer than their stalks. Bractæas linear-lanceolate, hairy. Corolla feathery. Leaves doubly pinnate, about as long as the heads. Branches hairy. Stem erect.—Native of stony hills at the Cape. Mr. Brown observed it near Simon's bay. It seems unknown in our gardens. This shrub is two or three feet high, with straight umbellate branches, rough with spreading permanent hairs. Leaves copious, moderately spreading, an inch, or sometimes an inch and half, long, hairy when young only; their segments very sharp-pointed. Flower-stalks often more than one at the top of each branch, half the length of the heads, with lanceolate-awl-shaped, spreading bractæas. Heads as big as a walnut, rising above the upper leaves. Corolla slightly curved; the hairs on its inner segment shorter than those of the other three. Stigma cylindrical, somewhat club-shaped.

S. Niveni. Niven's Serruria. Brown. n. 17. Ait. n. 4. (Protea decumbens; Andr. Repof. t. 349.)—Heads terminal, sessile. Bractæas lanceolate; the inner ones silky. Corolla bearded. Leaves doubly pinnatifid; the uppermost longer than the head, and smooth like the branches. Stem decumbent.—Discovered by Mr. James Niven, on Swartberg, a rocky mountain at the Cape of Good Hope, and sent by him to Mr. G. Hibbert in 1800. It blooms in the summer, and is of a small stature, and decumbent habit. The flowers are of a dull red, clothed externally with white silky hairs; and each solitary head, smaller than a hazel-nut, is encompassed with numerous, crowded, radiating leaves. Each leaf of the general foliage is about an inch long. Stigma hardly thicker than the style. Mr. Andrews's plate represents the branches as somewhat downy.

S. phyllicoides. Phylla-flowered Serruria. Brown. n. 24. Ait. n. 5. (Leucadendron phyllicoides; Berg. Cap. 29. Protea sphaerocephala; Linn. Mant. 188. P. abrotanifolia; Andr. Repof. t. 507.)—Heads terminal or axillary, on scaly stalks. Bractæas half as long again as the head, lanceolate, smooth; the outer ones narrowest. Tips of the corolla bearded. Leaves twice compound, longer than the flower-stalks.—Native of the Cape, from whence it was sent to Kew, by Mr. Maffon, in 1788; flowering there in July and August. This is a smooth upright shrub, with reddish leafy branches. Leaves generally bipinnatifid, an inch or two long, moderately spreading. The flower-stalks, clothed with several lanceolate scales, and either solitary, or aggregate in a corymbose manner, are longer than the heads, but usually shorter than the foliage. Heads above half an inch in diameter, subtended by many longish, deflexed, green, red-pointed bractæas. Corolla whitish and smooth, except the ends of the segments, which are red, and densely bearded. Stigma red, cylindrical.

S. florida. Large-flowered Serruria. Brown. n. 26. (Protea florida; Thunb. Diff. n. 2. t. 1. Prodr. 25. Willd. Sp. Pl. v. 1. 506.)—Bractæas longer than the stalked heads; the outer ones elliptic-oblong, pointed, smooth; inner concealed, linear-lanceolate, fringed. Leaves once or twice pinnatifid.—Thunberg and Maffon gathered this species on the mountains of Franche Hoek at the Cape. It has not as yet found its way into our green-houses, which is much to be regretted, no other Serruria being comparable to it in beauty. The leaves are three or four inches long, smooth, as well as the branches, which are of a purple hue. Flowers many together, on corymbose scaly stalks at the ends of the branches, large, remarkable for their beautiful red external bractæas, which are each an inch or inch and half long, attended by smaller ones, of the same kind, scattered down the stalk, while the innermost bractæas, coming into view by the spreading of the former, are linear, fringed, with

with yellow hairs. This is a very rare plant, even in dried collections.

Se $\text{\textcircled{t}}$. 2. *Heads compound; partial ones crowded.*

S. decumbens. Trailing Serruria. Brown. n. 27. (Protea decumbens; Thunb. Diff. n. 1. t. 1. Prodr. 25. Willd. Sp. Pl. v. 1. 506. *P. procumbens*; Linn. Suppl. 116.)—Stem prostrate, smooth, as well as the three-cleft leaves, whose segments are undivided. Each partial head of about four flowers.—Native of the stony sides of mountains, at the Cape of Good Hope; not as yet known as a garden plant. It is smooth, dividing from the root into several prostrate, leafy, wavy branches. Leaves ascending, about two inches long, in two or three simple, thickish, linear segments. Flower-stalks axillary and terminal, slender, scaly, each bearing a small roundish head, enveloped in ovate, pointed, rather silky bract $\text{\textcircled{e}}$ as, and composed of from four to six smaller heads. Corolla silky, very slightly curved. Mr. Brown remarks that some of the heads are, apparently from starvation or abortion, simple.

S. glomerata. Many-headed Serruria. Brown. n. 31. Ait. n. 6. (Protea glomerata; Linn. Mant. 187. Willd. Sp. Pl. v. 1. 509. Leucadendron glomeratum; Linn. Sp. Pl. 137. Serraria foliis tenuissimè divisis, capitibus tomentosis; Burm. Afr. 265. t. 99. f. 2.)—Stem erect, smooth like the doubly pinnatifid leaves. Partial heads of many flowers. Inner bract $\text{\textcircled{e}}$ as somewhat silky. Common flower-stalks scaly. Stigma club-shaped.—Found in stony hilly places at the Cape. Mr. Masson is said to have sent it, about the year 1789, to Kew, where it flowers in July and August. A rather humble shrub, with reddish branches. Leaves from one to two inches long, slender, quite smooth. Flower-stalks downy; the common ones often aggregate and racemose, clothed with broad, smooth, loosely imbricated, scaly bract $\text{\textcircled{e}}$ as; partial ones shorter than their respective heads. Corolla externally silky.

Se $\text{\textcircled{t}}$. 3. *Flower-stalks divided. Heads simple, corymbose or racemose.*

S. Burmanni. Burmann's Serruria. Brown. n. 36. Ait. n. 7. (Protea Serraria; Linn. Mant. 188. Willd. Sp. Pl. v. 1. 508. Leucadendron Serraria α ; Linn. Sp. Pl. 137. Serraria foliis tenuissimè divisis, floribus rubris apetalis; Burm. Afr. 264. t. 99. f. 1. Abrotanoides arboreum, &c.; Pluk. Mant. 1. Phyt. t. 329. f. 1.)—Heads corymbose, each of about ten flowers. Corollas level-topped, more or less silky, shorter than the partial stalks. Leaves doubly pinnatifid, bristle-shaped, longer than the flower-stalks.—Native of low barren spots, about the sides of hills at the Cape, very frequent. Mr. Masson sent it in 1786 to Kew garden, where it blossoms from May to July. A humble corymbose shrub, with very slender acute leaves, which are slightly hairy. The heads are small, reddish, crowned with the long prominent styles. Mr. Brown mentions a variety, or possibly distinct species, whose leaves are rather silky, heads more obtuse at their base, and bract $\text{\textcircled{e}}$ as, as well as flowers, altogether silky.

S. triternata. Silvery-flowered Serruria. Brown. n. 37. Ait. n. 8. (Protea triternata; Thunb. Diff. n. 7. Prodr. 25. Willd. Sp. Pl. v. 1. 509. *P. argentiflora*; Andr. Repof. t. 447.)—Corymbs compound. Heads globose, many-flowered. Bract $\text{\textcircled{e}}$ as and partial flower-stalks silky. Leaves thrice ternate, smooth as well as the stem.—Gathered by Mr. Niven, near the river at Roode Zant, Cape of Good Hope. Messrs. Lee and Kennedy are said to have first raised this elegant species, about the year 1802. It blossoms from June to August. The leaves are four or five inches long, and as thick as a crow's quill, being larger, as well as more compound, than in most other species. Heads

of flowers of a silvery white, silky, numerous, each rather above half an inch diameter. Stigma obovate, yellow.

SERSALISIA, so named after a Neapolitan ecclesiastic, much commended by Fabius Columna, (though in what part of his writings we are not informed,) is a genus separated by Mr. Brown, in his Prodr. Nov. Holl. v. 1. 529, from the Linnæan *Sideroxylon*; but the character does not seem to us very clear. One species of this new genus is *Sideroxylon sericeum*, Ait. Hort. Kew. ed. 1. v. 1. 262. ed. 2. v. 2. 13; another is called by Mr. Brown *Sersalisia obovata*. Both are natives of the tropical parts of New Holland. See SAPOTE and SIDEROXYLON.

SERSEY, in *Geography*, a town of Hindooستان, in Oude; 25 miles E. of Baraitch.

SERTA, GARLANDS, among the *Ancients*. See GARLAND.

SERTAM, in *Geography*, a town of Portugal, on the river Pera, in Eitremadura; 24 miles N.E. of Thomar.

SERTINO, a river of Sicily, which runs into the sea, on the east coast.

SERTORIUS, QUINTUS, in *Biography*, a distinguished Roman commander, was a native of Nurlia, in the Picentine regions of Italy. His father died in his infancy, but by the care of his mother he received a most excellent education; and even in his youth he gained a considerable reputation as a pleader at Rome. He had, however, a decided turn for the duties and glory attached to a military life, and made his first campaign under Servilius Cæpio, against the Cimbrians and Teutones in Gaul. In an early engagement he was severely wounded, and would have lost his life, if he had not possessed sufficient vigour to swim across the Rhone, when encumbered with his armour. He next served under Marius, and exhibited proofs of valour and talents, which much ingratiated him with that general. Spain was the next great theatre of his exertions, where he served under Didius, and acquired much reputation in the campaign. On his return to Rome, he was made questor in Cisalpine Gaul; and when the social war broke out, he brought a well-timed reinforcement to the Roman army. In a battle that ensued, he lost an eye, a mark of bravery in which he always gloried, and which pointed him out to the plaudits of the people, whenever he appeared in the theatre, and other public places. He was candidate for the tribuneship, but was disappointed in his hopes by the overbearing interest of Sylla: he accordingly joined the party of Marius in the succeeding civil war. He commanded one of the three armies which invaded Rome, and honourably distinguished himself by abstaining from all those acts of cruelty which disgraced the arms of Cinna and Marius. When Sylla gained the ascendancy in Italy, Sertorius withdrew to Spain, of which country he had been appointed pretor. Here he hoped to be able to revive his cause, and with this view he detached a body of troops to seize the passes of the Pyrenees; but the murder of their commander induced them to abandon their post, and consequently laid Spain open to Sylla's officers. After some various adventures, chiefly of the disastrous kind, Sertorius went into Africa, and assisted the Mauritians to throw off the yoke of a tyrannical king; defeating one of Sylla's generals, by whom he was supported. His reputation now caused him to be invited to Lusitania; and failing thither with a small body of Romans and Africans, he obtained such an ascendancy over the natives, that he soon had the command of the whole Lusitanian nation. He exercised them in the arts of warfare, and introduced a rigid discipline among them; but Roman tactics being unsuitable to them, he adopted a service better suited to the nature and circumstances

stances of the country. He defeated, with his new-trained armies, several Roman generals, who were sent against him, and instituted a senate in competition with that of Rome, and imitated all the forms of the republic. He foiled the attempts of that eminent commander, Metellus, to reduce him; continually harassing his troops by sudden attacks and skirmishes, and intercepting his convoys. He adopted the liberal policy of civilizing the Lusitanians and neighbouring Spaniards, and familiarizing them with Roman letters and customs. For this purpose he established a great school in the city of Osca, at which the sons of men of distinction were gratuitously educated, and at the same time kept as hostages for the fidelity of their parents. Feeling that his power was not sufficiently firm, without the aid of superstition, which ever captivates the ignorant and uncivilized, he trained a white fawn, that had been presented to him, to such a degree of tameness, that it followed him whithersoever he went, and was his constant companion; and he encouraged the belief that the animal was the gift of Diana, and intended by that goddess to convey him information of the designs of his enemies. At length the famous Pompey was nominated to the command against him; and when he arrived, he found that all the Roman troops, which, after the death of Lepidus, had been carried to Spain by Perseus, with the design of setting up there for himself, had joined Sertorius, who was now at the head of a considerable army. Pompey proceeded against him with a superior force; but Sertorius took a town in his presence, and afterwards defeated him at the battle of Sucro. He gave him a second defeat; but Metellus routed a separate division, and Sertorius was glad to take to the mountains. He then offered to lay down his arms, provided the proscription against him might be taken off, and he were permitted to return to Rome. Soon after he received an embassy from Mithridates, the formidable foe of the Romans, offering him an advantageous alliance, provided he were suffered to repossess the provinces from which he had been expelled by Sylla. But Sertorius would not agree to more than his recovery of Bithynia and Cappadocia, without touching upon the Roman province of Asia; and upon these terms the treaty was concluded. A conspiracy was formed against Sertorius by the Roman patricians in his army, and they succeeded in exciting a revolt in several Lusitanian towns. Incensed at this defection, he caused several of the children, whom he kept as hostages at Osca, to be slain, and others to be sold as slaves. This is said to have been the only act of cruelty by which his memory is tarnished. In revenge for the loss of their sons, the conspirators formed a plot against the life of Sertorius; in consequence of which he was basely assassinated, while he was at a feast. This event took place in the year 73 B.C. "The great qualities and military talents of this eminent person would undoubtedly have raised him to the first rank among the chiefs of his country, had he not been a leader of a party, instead of a commander for the state. With nothing to support him but the resources of his own mind, he created a powerful kingdom among strangers, and defended it a long time against the arms of Rome, although wielded by the ablest generals of his time; and he displayed public and private virtues, which would have rendered a people happy under his rule at a less turbulent period." *Univer. Hist.*

SERTULA CAMPANA, in *Botany*, a name given by some authors to melilot.

SERTULARIA, in *Natural History*, a genus of the class Vermes, and order Zoophytes. The generic character is this: the animal grows in the form of a plant; the stem is branched, producing polypes from cup-shaped den-

ticles, or minute cells. There are nearly four-score species, divided into two sections, A and B, of which the following is the description.

A. Stem horny, tubular, fixed to the base, beset with cup-shaped denticles, and furnished with vesicles, or ovaries, containing polypes, eggs, or living young.

Species.

* **ROSACEA**. This species is panicked, with opposite, tubular, truncate denticles, and alternate branches; the vesicles are crowned with spines. It inhabits the European seas, and our own coasts, growing on shells, or creeping up other corallines; it is white; the vesicles resemble the blossom of the pomegranate.

* **PUMILA**. The denticles of this species are opposite, pointed, and recurved; the vesicles are obovate; the branches loose and irregular. It is found in the ocean, on fuci, particularly on the *ferratus*.

* **OPERCULATA**. Denticles opposite, pointed, and nearly erect; the vesicles are obovate, covered with a lid; the branches are alternate. It inhabits the European and American seas, on fuci and shells. The twigs are about five inches long; the denticles are bicuspidate, with a short bristle on each side.

* **TAMARISCA**. Denticles nearly opposite, truncate, three-toothed; vesicles ovate, two-toothed, with a short tube in the centre; the branches are alternate. This is found in most of the European seas, and is the largest of its kind. It is about four inches long, and is found adhering to shells.

* **ABIETINA**. Denticles nearly opposite, tubular, oval; the vesicles are oval, and the branches alternate. It is found in the British and other European seas, and the Mediterranean, growing to shells. It is five inches long, and often covered with small serpulæ; the branches are frequently pinnate.

* **NIGRA**. Denticles nearly opposite, minute; vesicles large, placed all on one side, oval, quadrangular; the branches are pinnate. This is found on the Cornish coast, adhering to the *Mytilus margaritiferus*. It is four inches long, blackish.

* **FUSCESCENS**. Denticles nearly opposite, tubular; the vesicles are numerous, placed all on one side, minute, with three tubercles on each; the branches are pinnate. This is also an inhabitant of the Cornish coast. It resembles the last, but is of a greyish-brown colour.

OBSOLETA. Denticles generally placed in eight rows, ovate, slightly heart-shaped, and disposed in a quincunx form; the branches are alternate and pinnate. It is an inhabitant of the Frozen ocean, is about five inches high, and of a horn colour, with the joints becoming more and more obsolete towards the top.

PINUS. Denticles sub-spinous, generally disposed in six rows; the vesicles are bottle-shaped, turgid, subdiaphanous, with a simple mouth; the branches are pinnate, nearly alternate. It inhabits the White sea, fixed to shells.

CUPRESSOIDES. Denticles simple, obliquely truncate, with a slightly protuberant mouth; the vesicles are ovate, with a subtubular mouth; the branches are dichotomous, loose, and with the trunk joined with two rings at the junctures. This is found in the White sea; is subdiaphanous, yellowish, and nearly half a foot long.

* **CUPRESSINA**. Denticles nearly opposite, obliquely truncate, and a little pointed; vesicles obovate, two-toothed; branches panicked, and very long. It is common in all the European seas, and is found in a long pointed loose panicle.

* **ARGENTEA**.

SERTULARIA.

* **ARGENTEA.** Denticles nearly opposite, pointed; vesicles oval; branches alternate, paniced. This is an inhabitant of the European and American seas; very much resembles the last, but the branches are shorter and looser, and the panicle is more obtuse.

* **RUGOSA.** Denticles nearly opposite, obsolete; vesicles much wrinkled, and three-toothed; the branches are scattered. This species inhabits the European seas, and is found growing on the *Flustra foliacea*, and other *sertularia*.

* **HALECINA.** Denticles alternate, tubular, and two-jointed; the vesicles oval, each united along the side to a small tubular stalk; the stem is alternately branched and pinnate. This is found in the European and Mediterranean seas. It is horny, and of a yellowish-grey; the denticles are nearly obsolete.

* **THUJA.** The denticles in this species are arranged in two rows, closely adhering to the stem; the vesicles obovate, margined; stem waved and stiff, with a tuft of dichotomous branches near the tip. It is found on the northern coasts of England, and in the Mediterranean, and is about half a foot long.

* **MYRIOPHYLLUM.** The denticles are truncate, all leaning one way on the stem; the stem itself is gibbous on the side opposite the branches; the branches lean all one way. This is found in most European seas, and in the Mediterranean; it is about three inches long, is pale and horny; the stem is rather angular, with arched protuberances opposite the branches; the denticles are seated in a socket furnished with a short spine on the lower part.

* **HYPNOIDES.** Denticles pointing one way, campanulate, toothed, and beaked; stems with pinnate branches, and very crowded subdivisions. It inhabits the Indian ocean, is six inches high; in colour it is brown, with yellowish imbricate radicles.

* **SPECIOSA.** Denticles campanulate, effuse, toothed, and stipulate; the stem is pinnate, rigid, with incurved branches, mostly pointing one way. It is found in the Indian ocean, adhering to the tubular radicles of *gorgonia*; it is brown, horny, and from three to four inches long.

* **FALCATA.** The denticles of this species point all one way; they are imbricate and truncate; the vesicles are ovate; the branches are pinnate and alternate. There is a variety of this species described by Ellis, in his work on *Corallines*. It inhabits the European and Indian seas, and is from three inches to a foot long; the stem is a little flexuous; the denticles in a single row.

* **PLUMA.** In this the denticles point one way, they are imbricate and campanulate; the vesicles are gibbous and crested; the branches are pinnate, alternate, and lanceolate. It is found on most European coasts, climbing up fuci; the branches are jointed; the denticles are ferrate at the margin, and supported in front by a small hollow spine; the vesicles have a denticulate margin, and generally five oblique crested ribs.

* **ECHINATA.** Denticles opposite, pointing one way, campanulate; the vesicles are crested; the branches pinnate, alternate, and lanceolate. It inhabits chiefly the shores of Sweden, on fuci.

* **ANTENNINA.** The denticles are verticillate, in fours, fetaceous; vesicles obliquely truncate, verticillate; the stems are generally simple. There is a variety which is branched. They are both found on the British coasts, often nearly a foot high; it is yellow, with very fine capillary yellowish radicles; the stem is surrounded with small incurved fetaceous branches, on the upper sides of which are rows of small cup-shaped denticles; the vesicles are placed

on pedicles obliquely open towards the stem, and placed round it at the insertion of the branches.

* **VERTICILLATA.** The denticles in this are obsolete; the vesicles campanulate, toothed round the rim, on long twisted pedicles, and placed in fours round the stem; the branches are alternate. It is found on the British coasts; stem ribbed, very loosely branched; the denticles are not visible; the vesicles are nearly erect, and glutinous; the ovaries are oval, ending in a tubular mouth.

* **GELATINOSA.** Vesicles campanulate; stem with numerous decomposite spreading branches. It is found on the coasts of the Netherlands; is half a foot long, and of a greyish-brown colour.

* **VOLUBILIS.** The denticles in this are obsolete; the vesicles are alternate, campanulate, toothed round the rim, on long, twisted pedicles; the branches are alternate. It inhabits European seas, climbing up other *sertularia*; it is whitish and minute; the stem is loosely branched; the ovaries are egg-shaped and smooth, or transversely wrinkled.

* **SYRINGA.** Denticles obsolete; vesicles cylindrical, mostly alternate, and placed on short twisted pedicles.

* **CUSCATA.** Denticles obsolete; vesicles oval, axillary; branches opposite and simple. It is found in the European seas, adhering to fuci.

* **PUSTULOSA.** Stem with alternate dichotomous branches, obsoletely denticulate on the upper part. It inhabits the shores of the Isle of Wight, and is four inches long. The stem is seen rising into alternate dichotomous joints, with small denticles, having a circular rim, with a point in the middle of each towards the upper part of each joint.

* **FRUTESCENS.** Denticles cylindrical, campanulate, placed in a single row on the inside of the branches; the branches are alternate, and pinnate. This is chiefly found on the British shores; rather hard, blackish with brown branches; the stem is composed of small united tubes.

* **PINASTER.** In this species the denticles are opposite, sessile, with an incurved tubular tip; the vesicles are large, ovate, quadrangular; the angles terminating in a spine, and furnished with a tubular mouth in the centre, placed in a row along the branches; the branches are alternate.

* **PENNATULA.** The denticles in this are in a single row, crenate on the rim, and supported by a slender, truncate, incurved horn; the branches are opposite. It is found in the Indian ocean; is five or six inches long; yellowish-brown; the denticles have two opposite spines on the rim.

* **FILICULA.** Denticles opposite, ovate, with a single erect one at the junctures of the branches; vesicles obovate, with a tubular mouth in the centre; the stem is zig-zag, with alternate branches. It inhabits the British shores, is very tender, and the stem is much branched.

* **QUADRIDENTATA.** Denticles in fours, opposite, at the joints of the stem; the stem is simple, with the joints tapering and twisted towards the base. It inhabits the African shores on the *Fucus lendigerus*.

* **SPICATA.** Denticles in three, cylindrical, terminal, and nearly closed at the mouth; vesicles ovate, axillary; stem tubular, paniced, annulate, with trichotomous branches disposed in whorls round the rings.

* **EVANSII.** The denticles are short and opposite; the vesicles are lobed, arising from the branches which are opposite. It inhabits the British coasts, and is found on fuci; it is two inches high, very slender, and yellow, with fulvous vesicles.

* **MURICATA.** The denticles of this species are pedicled, proceeding alternately from the joints of the branches; vesicles oval, spinous; the stem is jointed. It is found on the shores of Scotland; the vesicles are nearly globular,

SERTULARIA.

placed on pedicles, and full of pointed spines from crested ribs.

SECUNDARIA. Denticles in a single row, campanulate; the vesicles are axillary; the stem is minute, white, and incurved. This species is found in the Mediterranean: it is scarcely three lines high, and not thicker than a fine bristle.

MISENENSIS. The denticles are alternate, very thin, spreading; the vesicles are oval, peduncles axillary; stem much branched, dichotomous. It inhabits the Mediterranean, is very slender, pellucid towards the tip, and sometimes covered with the Cancer linearis.

RACEMOSA. Denticles scattered, pellucid; vesicles clustered; stem straight, round; opaque, horny, with slightly curved branches. It inhabits the Mediterranean.

* **UVA.** Denticles obsolete; vesicles ovate, clustered; stem slightly branched, with alternate subdivisions. It inhabits the shores of this country and Holland, adhering to other zoophytes; vesicles transparent, with a white nucleus.

* **LENDIGERA.** Denticles obsolete; vesicles cylindrical, arranged in a single row along the branches, and growing gradually less towards the top: the stem and branches are jointed. This is found on the European coasts, on other zoophytes. The branches are subdivided and irregularly interwoven; the vesicles are placed in parallel ranks along the inside of the branches, and growing gradually shorter towards the top of the joints.

* **GENICULATA.** Denticles alternate, twisted; vesicles obovate, with a tubular mouth in the centre; the stem is branched, jointed, flexuous. It inhabits the European coasts, adhering to fuci.

* **DICHOTOMA.** Denticles obsolete; vesicles obovate and axillary, on twisted pedicles; the stem is dichotomous, with twisted joints. It inhabits the British and Dutch coasts, and is nearly a foot long; it is white, but becomes testaceous with age.

* **SPINOSA.** Denticles obsolete; vesicles ovate, subulate; the branches are dichotomous and spinous. It is found on most European coasts, as well as on those of this country, and is about eight inches long. The stem is composed of interwoven tubular fibres; the branches are flexuous, loose, forked, with pointed tips.

* **PINNATA.** The denticles of this species are obsolete; the vesicles are oblong, and surrounded with a coronet of tubercles at the rim; stem simple, pinnate, and lanceolate. It is found in Europe and in India, and is about three inches high. The stem is simple, with alternate subdivisions; the vesicles are placed in clusters round the stem.

* **SETACEA.** Denticles obsolete, remote, placed in a row on the upper side of the branches; vesicles oblong, axillary; the stem is simple, with alternate bent divisions. It inhabits the European coasts, and is about an inch and half high.

* **POLYZONIAS.** Denticles alternate, slightly toothed; vesicles obovate, transversely wrinkled; the stem is loose, branched. It inhabits most seas, adhering to marine substances.

PENNARIA. The denticles are placed in a row on one side the branches; the vesicles are oval; the stem is twisted, and doubly pinnate. It inhabits the Mediterranean sea, growing in tufts on rocks; the stem is straight, ascending, flexible, horny, brown with whitish branches.

* **LICHENASTRUM.** Denticles alternate, obtuse, in two imbricate rows along the stem; the vesicles are ovate, in two parallel rows along the branches; the stem is simple, alternately pinnate. It is found in the Irish, Indian, Asiatic, and

Armenian seas. The stem is erect, jointed, compressed, and denticulate; the branches are alternate, denticulate, and straight.

CEDRINA. Denticles subcylindrical, tubular, in four imbricate rows; the branches are irregular, quadrangular, and thicker upwards. Inhabits the seas of Kamtschatka; the branches are dichotomous, obtuse, with four rows of vesicles.

* **IMBRICATA.** The vesicles of this species are subclavate, irregularly imbricate upwards; the stem is slightly branched. This species is described and figured in the 5th vol. of the Linnæan Transactions. It inhabits the western coast of Britain, on the *Fucus nodosus*; it very much resembles the last, but the vesicles are not placed in any regular series; it is about three inches high; the smaller branches have the vesicles placed bifariouly, but towards the tip they become imbricate.

PURPUREA. Denticles subovate, tubular, in four imbricate rows; the vesicles are erect and campanulate; the branches are dichotomous and square. It inhabits the sea round Kamtschatka, and is of a blackish-purple.

ARTICULATA. Denticles pressed together; the vesicles are ovate, rather large, covered with a lid, and placed in a single row; the stem is jointed and pinnate. It is found in the Atlantic ocean, creeping on shells, and is about two inches long; pale yellow.

FILICINA. Denticles imbricate, placed on one side only; vesicles jointed; stem granulate, branched and pinnate, the subdivisions alternate. It inhabits the Indian ocean, is pale, and about three inches long.

FRUTICANS. The denticles of this species are in a single row on one side; semi-campanulate; the stem is granulate, woody, with alternate setaceous subdivisions. It inhabits the American seas in tufts, on shells: it is six inches long, and of a yellowish-grey.

B. The species of this division have a crustaceous stem, inclining to stone, and composed of rows of cells; they have no vesicles, but in the place of these there are small globules.

* **BURSARIA.** Denticles opposite, compressed and truncate; the stem is branched, and dichotomous. It is found on the British coasts, adhering to fuci; it is minute, flexible, hyaline; the denticles are carinate, with a small clavate tube at the top.

* **LORICULATA.** Denticles opposite, obliquely truncate, and nearly obsolete; the branches are erect and dichotomous. It inhabits the British coasts, on old sertulariæ.

* **FASTIGIATA.** Denticles alternate, pointed; branches dichotomous, erect. This is found in the British seas; the denticles are marked with a black spot in the middle.

* **ARICULARIA.** The denticles all point one way, nearly opposite, and furnished with two mucronate appendages; the globules appendaged; the stem is branched and dichotomous. It is found in the European seas; is from one to two inches long; in colour it is of a dirty grey. It is very brittle.

* **NERITINA.** The denticles are alternate, acute, and pointing one way; the branches are dichotomous, unequal, and straight. It is found in the European and American seas. It is soft; the globules have an opening surrounded by a dark-coloured margin.

* **SCRUPOSA.** Denticles alternate, angular, spinous; the branches are dichotomous and creeping. It inhabits most seas; is very brittle, linear, and pale, with a double row of cells.

PILOSA. The denticles are alternate, oblique, with a long mouth; the branches are dichotomous, fastigate, and strong.

strong. It is found in the Mediterranean, and is not half an inch long.

CRISPA. This species is very much branched, dichotomous, elongated, and crisp, with depressed ovate joints, furnished with cells on one side. It inhabits the East, is large, flexible, and of a pale-grey colour.

FLOCCOSA. This is very much branched, dichotomous, fastigiate, with wedge-shaped joints, having cells on one side. This is found chiefly in the Indian ocean; is large, whitish, with greyish flexible joints.

*** REPTANS.** Denticles alternate, two-toothed; the branches are dichotomous and creeping. This is found in the European seas, adhering to the *Flustra foliacea*; it is not an inch long; white or pale-grey.

PARASITICA. The denticles of this species are verticillate, turbinate, ciliate, and parasitical. It is found in the Mediterranean and North seas, adhering to other *fertulariæ* and corallines; in colour it is dull red, with terminal denticles.

*** CILIATA.** Denticles alternate, ciliate, funnel-form; branches dichotomous and erect. It inhabits the European seas, on marine substances; not half an inch high; it is whitish; the cells have wide mouths.

*** EBURNEA.** The denticles are alternate, truncate, a little prominent; the vesicles are gibbous, with a tubular beak on one side; the branches spreading. This inhabits the European and Mediterranean seas, and is found growing upon other *fertulariæ* and *fuci*; is about an inch high, and white.

*** CORNUTA.** The denticles are alternate and truncate, with a single hair on the top of each; the vesicles are gibbous, with a tubular beak; the branches are alternate. This inhabits, like the last and two following, the European and Mediterranean seas, on *fuci*; it is stony, clear white, and not half an inch long. The denticles are curved, tapering towards the base, and placed on each other.

LORICATA. Denticles in a concatenate row, pointing one way, with a margined mouth, horned beneath; the branches are alternate. It is found on *fuci*. The denticles are like inverted horns placed on each other, with a short hair on the top.

*** ANGUINA.** The stem is very simple, without denticles, but beset with very simple, obtuse, clavate arms, each with a lateral opening. This is found climbing up marine substances; it is white, soft, flexible, varying in form, and appears to connect the *fertulariæ* and *hydræ*; the arms are testaceous.

CEREOIDES. Denticles imbricate, with somewhat prominent mouths; the stem is branched, jointed, and cylindrical. It inhabits the coast of Africa; is three inches high; whitish, stony, aggregate, with short joints.

TULIPIFERA. Cells in threes on the upper part of the joints, and united together; stem branched, with clavate joints. It inhabits the West Indies, adhering to *fuci*, about half an inch high, and clear white; the stem is stony and subdiaphanous; the cells are terminal.

FLABELLUM. This species is stony, branched, jointed, dichotomous; the joints are somewhat wedge-shaped, and have cells on one side. It inhabits the Bahama islands, is about two inches high, white, growing in tufts; the joints are convex and striate on one side; the others are flat, with a triple row of cells.

*** TERNATA.** Branched, dichotomous, jointed, creeping; the joints are angular at their sides, with three cells in the front of each. It inhabits the shores of Scotland; it is stony, semitransparent.

CIRRATA. Stony, jointed, flat, dichotomous, incurved,

the joints are subciliate, ovate, truncate, flat, and having cells on one side. It inhabits the Indian ocean, is about two inches high, and is white; the joints are convex, and striate on one surface; the other is flattened, with a double row of cells.

OPUNTIODES. Branches in threes, with cylindrical joints, covered with slightly prominent pores. It inhabits the Eastern ocean; is about half an inch high, erect, very much branched, white, stony, with the pores disposed in a quincunx form.

SERVA, in *Geography*, a town of Persia, in Segestan; 180 miles S.S.W. from Zareng.

SERVAGE. See **SERVICE**.

SERVAL, in *Zoology*. See **FELIS Serval**.

SERVAN, in *Geography*, a town of France, in the department of the Ille and Vilaine, and chief place of a canton, in the district of St. Malo. The place contains 8836, and the canton 10,617 inhabitants, on a territory of 50 kilometres, in 4 communes.

SERVANDONI, JOHN NICHOLAS, in *Biography*, an eminent architect, was born at Florence in 1695. He was employed by several of the sovereigns in Europe on occasions of magnificent public spectacles, in which he displayed a very fertile invention, with nobleness of ideas, and a correct taste. At Paris he had the direction of the theatre during 18 years, and was architect, painter, and decorator to the king; and was admitted member of the several academies of arts. He gave a number of designs for the theatres of Dresden and London, and was sent for to the latter capital on the rejoicings for peace in 1749. He presided at the grand festivals exhibited at the court of Vienna, on the marriage of the archduke Joseph and the princess of Parma. The king of Portugal frequently employed him, and honoured him with the order of Christ. He died at Paris in 1766, having acquired the reputation of being the first artist of the period in which he flourished. As an architect he has left a fine specimen of his taste in the portico and front of the church of St. Sulpice.

SERVANT, SERVUS, a term of relation, signifying a person who owes and pays a limited obedience for a certain time to another, in quality of master; in contradistinction to *slave*, over whose life and fortune the master claims an absolute and unlimited power. See **SLAVE**.

The first sort of servants, acknowledged by the laws of England, comprehends *menial* servants; so called from being *intra mania*, or *domestics*. The contract between them and their masters arises upon the hiring: if the hiring be general, without any particular time limited, the law construes it to be hiring for a year (Co. Litt. 42. F. N. B. 168.); but the contract may be made for any larger or smaller term. All single men between twelve years of age and sixty, and married ones under thirty years of age; and all single women between twelve and forty, not having any visible livelihood, are compellable by two justices to go out to service in husbandry, or certain specific trades, for the promotion of honest industry; and no master can put away his servant, or servant leave his master after being so retained, either before or at the end of his term, without a quarter's warning, unless upon reasonable cause, to be allowed by a justice of the peace (stat. 5 Eliz. c. 4.); but they may part by consent, or make a special bargain.

Another species of servants includes those called *apprentices* (which see): a third sort belongs to that class denominated labourers. See **LABOUR** and **LABOURERS**.

And there is a fourth species, if they may be called servants, being rather in a superior capacity of service; such as stewards, factors, and bailiffs, whom, however, the law

SERVANT.

considers as servants *pro tempore*, with regard to such of their acts as affect their master's or employer's property. The treatment of servants, strictly so called, as to diet, discipline, and accommodation, the kind and quantity of work to be required of them, the intermission, liberty, and indulgence to be allowed them, must in a great measure be determined by custom; for the contract between them and their masters expresses only a few of a considerable variety of particulars which it is supposed to comprehend. A servant is not bound to obey the unlawful commands of his master; *e. g.* to minister to his unlawful pleasures; or to assist him by unlawful practices in his profession. For the servant is bound by nothing but his own promise; and the obligation of a promise extends not to things unlawful. For the same reasons, the master's authority is no *justification* of the servant in doing wrong; for the servant's own promise, upon which that authority is founded, would be none. A master may by law correct his apprentice for negligence, or other misbehaviour, provided it be done with moderation; though if the master or master's wife beat any other servant of full age, it is good cause of departure: but if any servant, workman, or labourer, assaults his master or dame, he shall suffer one year's imprisonment, and other open corporal punishment, not extending to life or limb. (5 Eliz. c. 4.) By service, all servants and labourers, except apprentices, become intitled to wages; according to their agreement, if menial servants; or according to the appointment of the sheriff or sessions, if labourers or servants in husbandry. For to them only the statutes for regulation of wages extend.

A master may maintain, *i. e.* abet or assist his servant in any action at law against a stranger; he may also bring an action against any man for beating or maiming his servant, assigning his damage by the loss of service, and proving the loss upon the trial: he may likewise justify an assault in defence of his servant, and a servant in defence of his master (2 Roll. Abr. 546.): and if any person hire or retain my servant, being in my service, I may have an action for damages against both the new master and the servant, or either of them; but if the master did not know that he is my servant, no action lies, unless he afterwards refuse to restore him upon information and demand. F. N. B. 167, 168.

As for those things which a servant may do in behalf of his master, they seem to be grounded on this principle, that the master is answerable for the act of his servant, if done by his command, either expressly given or implied; therefore, if the servant commit a trespass by the command or encouragement of his master, the master shall be guilty of it: if any inn-keeper's servants rob his guests, the master is bound to restitution (Noy's Max. c. 43.); and if the drawer at a tavern sells a man bad wine, by which his health is injured, he may bring an action against the master. (1 Roll. Abr. 95.) In the same manner, whatever a servant is permitted to do in the usual course of his business, is equivalent to a general command; if I pay money to a banker's servant, the banker is answerable for it; if a steward lets lease of a farm without the owner's knowledge, the owner must stand to the bargain: a wife, friend, or relation, that used to transact business for a man, are *quoad hoc* his servants, and the principal must answer for their conduct. Farther, if a servant, by his negligence, does any damage to a stranger, the master shall answer for his neglect: if a smith's servant lames a horse while he is shoeing him, an action lies against the master and not against the servant. A master is chargeable if any of his family layeth or carrieth any thing out of his house into the street, or common

high way, to the damage of an individual, or the common nuisance of his majesty's liege people. In case of fire the servant is accountable. Blackst. Comm. book i. See LARCENY.

Much depends upon the sobriety, integrity, and diligence of servants; and the ease with which they obtain characters, or procure employment with such characters, real or fictitious, as they gain, is very injurious both to their employers and to themselves. Characters are given with so little reserve and veracity, "that I should as soon depend," says the author of the Rambler, "upon an acquittal at the Old Bailey, by way of recommendation of a servant's honesty, as upon one of these characters." At the same time another extreme should be avoided, which is that of obstructing the advancement of a faithful and deserving servant, either from resentment, caprice, or self-interest. In order to form good servants, attention should be paid to their domestic conduct, and that kind of discipline should be exercised at home which may contribute to prevent their corruption and misery.

What the Christian scriptures have delivered concerning the relation and reciprocal duties of masters and servants, breathes a spirit of liberality, very little known in ages when servitude was slavery; and which flowed from a habit of contemplating mankind under the common relation in which they stand to their Creator, and with respect to their interest in another existence. (Ephes. vi. 5—9.) "Servants be obedient to them that are your masters, according to the flesh, with fear and trembling; in singleness of your heart, as unto Christ; not with eye-service, as men-pleasers, but as the servants of Christ, doing the will of God from the heart; with good will, doing service as to the Lord, and not to men: knowing that whatsoever good thing any man doth, the same shall he receive of the Lord, whether he be bond or free. And ye masters do the same thing unto them, forbearing threatening; knowing that your master also is in heaven; neither is there respect of persons with him." The idea of referring their service to God, of considering him as having appointed them their task, that they were doing his will, and were to look to him for their reward, was new; and affords a greater security to the master than any inferior principle, because it tends to produce a steady and cordial obedience in the place of that constrained service, which can never be trusted out of sight, and which is justly enough called eye-service. The exhortation to masters, to keep in view their own subjection and accountableness, was no less reasonable.

The Romans, besides their slaves, whom they also called *servi*, had another kind of servants, whom they called *nevi* and *additi*, who were such as being in debt, were delivered up to their creditors by the prætor, to work out the debt, after which they were again at liberty.

The pope, out of his wonderful humility, calls himself in his bulls, *the servant of the servants of God, servus servorum Dei*. The first who used the appellation, as Diaconus tells, were pope Damasus, and Gregory the Great, which last is said to have used it to check, by his modesty, the arrogance of John, patriarch of Constantinople, who took the title of *æcumenical*. Du-Cange adds, that the title servant has been assumed by some bishops, by some kings, and some monks.

SERVANT, in *Agriculture*, a person employed in the performing of some part of the business of a farm, of whatever kind it may be. On this subject, the following judicious hints have been thrown out by the author of the "Landed Property of England," for the direction of those servants who have the conducting of the management of farming

SERVANT.

farming business. Nothing, he contends, contributes more to facility and satisfaction in this sort of business, than a forecast toward works to be done. A miscarriage is ever to be dreaded as a mischief; and when it is brought on by a want of forethought, it brings with it a degree of discredit, and a train of unpleasant reflections, which sour every enjoyment. This kind of servant should, he thinks, have a forecast towards crops for three or four years; toward team-labour for as many months; and should look forward with a view to hard labour for some weeks, according to the season of the year. And to bring it to a degree of certainty, it is necessary to make out a list of the fields, or parcels of land, of which the farm consists; with the crops which each has borne for some years back; together with the manurings which they have severally received, in order that the future treatment of each may be decided upon with sufficient accuracy. And to prepare every autumn, by the assistance of such list, an arrangement of the crops that are intended for the ensuing year; classing the fields, or pieces, according to the purposes for which they shall be intended: thus ascertaining the quantity of each crop, whether arable or grass, as well as the quantity of ground intended for pasture; in order that the quantity of team-labour may be distinctly foreseen,—the required strength be estimated from time to time,—and the several crops be sown in due season; and in order that the stock of the ensuing summer may, in due time, be properly apportioned to the intended quantity of pasture ground; as well as that the works of summer and harvest may be constantly before the eye; and proper hands be engaged, in time, to perform them in season, and with the necessary dispatch and certainty. And he further advises a sort of memorandum list to be kept of business to be done,—immediately,—or in immediate succession; whether it relate to crops or to any other concerns of the farm; that nothing may escape the memory; and that the most requisite may be brought forward first; or another which is more suitable to the state of the weather, or other circumstances. In this, as well as other business, the great object to be aimed at is that of ensuring success; which is not only profitable to an employer, but satisfactory to the person employed. Whereas a miscarriage injures at once the property of the one, and the character, as well as peace of mind, of the other. Hence a farm manager ought to engage in a work, whether of improvement or ordinary practice, with caution; and to proceed in it with attention and firmness. A standing rule, respecting this main object of management, is not to attempt too much, and never to begin a work without a moral certainty of being able to finish it in due season.

Further; but besides the common work of a farm, as the culture and harvesting of crops, the rearing and fattening of live-stock, and the business of markets; there are various other objects of attention which ought to be constantly kept in the mind, or in the mind's way, of a manager; as on them the difference between good and bad, between correct and slovenly management, very much depends; such as keeping the homestead in repair, and free from impediments; attending to private roads and driftways; keeping up fences, every where, in thorough repair; attending particularly to young hedges, and to the rearing of hedge-row timber; the seeing that gates swing clear, and catch with certainty; equally to preserve them from injury, and to prevent loose stock from going astray; the attending to drains and water-courses; to see that superfluous waters have free passages to their proper outlets, and be readily discharged. And it is advised, that in summer strict attention be paid to drinking-

pools and other watering places of stock, as well as to the state of pasturing, and the shifting of pasturing stock. Likewise to weeds, as well in grass grounds as in arable lands, to see that not a thistle blows, nor any other weed manures its seed, either in the areas, or on the borders of fields, as great injury is done by their shedding their seeds.

Also in winter, much care is necessary to the cattle-stock, not only to see that they are regularly supplied with proper fodder; but that sufficient shelter and comfortable resting-places are assigned them, so that they may be kept in a proper thriving state. At this season also the watering of grass-lands should be attended to as much as the nature of the situation will admit. And to the accumulation of manure an unremitting care should be bestowed the year round, as upon it much depends. And on the whole, to perform these and other objects with propriety, repeated examinations of every part and particular under his care; and committing to his memory whatever requires his more immediate attention; so that whether he is on the spot, or arranging his plan of operation, in the hour of leisure, it may be present to his mind, and take its proper course in the routine of work which is to be carried forward.

It may be noticed, that in the time of work the business of a managing servant lies in the field, in executing the plans he has formed, in passing from one set of work-people to another: not more to see that the different operations are rightly executed, with proper dispatch, than to order any required assistance, (to the teams most especially,) in order that every part of the machine may be kept in profitable motion. And that in the ordinary operations of husbandry, and on common occasions, a steady even pace be recommended; equally for the good of working animals, and the work which they are performing. Nevertheless, there are times when quick dispatch is necessary: and then it is his duty to encourage good speed; by his example, and by promises of reward, if the occasion require it. That at all times, and on every occasion, idleness is a crime which ought not to be suffered to pass with impunity. It is a direct fraud; and a manager should guard against it with the same care and assiduity as against pilfering. A day labourer who idles away an hour, robs his employer of an hour's wages; and thereby injures him as much as if he were to steal a faggot of equal value. This truth requires to be deeply imprinted on the minds of labourers. He has known the impression to have a good effect. But he properly remarks, that the right ordering of servants and work-people is a difficult branch of moral duty; and forms an important part of that of the managing servant. They require to be treated according to their respective merits; encouraging good ones by extra wages, or other rewards. Some men are worth double the wages of others, as day labourers. Yet custom makes no distinction between them in this respect! Hence the propriety of engaging the best workmen the country affords; and retaining them, by civil treatment, and suitable encouragements. The managing servant should keep his work-people at a proper distance, without destroying that free communication of opinion respecting the work in hand, which, on ordinary occasions, every intelligent workman should be allowed. And a standing rule of conduct, in the ordering of workmen, is never to find fault without occasion: nor to commend, without reason. Good fellows will not brook the former, nor will bad ones be mended by the latter. But it is right to habituate workmen in general to be told of their faults; first, in the mildest terms the occasion will admit of; reserving the warmth of temper for extraordinary occasions;

SERVANT.

occasions; and then it is prudent to fling them with keen, rather than to load them with heavy, words: to endeavour to stir up their pride, rather than their malice or resentment. And much of the smoothness and uniform success of business depends on the manner of communicating orders to workmen. If orders are inaccurately or loosely given, it is unreasonable to expect that the execution of them should be faultless. It is difficult to explain business in words with sufficient accuracy to rustic workmen; and if a third person is suffered to intervene, errors are inevitable. The servant who has the management ought therefore to make a point of giving orders, in person, and if possible on the spot, to the men whom he means shall execute them. There he can explain himself to them intelligibly and fully; or assist them in marking out their work. There is always danger in merely verbal orders; and, in a message, certain mischief. It should be an invariable rule for him to set his men to a fresh work, in person; and if it is out of the common way of husbandry, to stay by them, or direct them with his own hands; and return to them, again and again, until he finds them completely in their work. In this view, this sort of servant, as well as for various other reasons, ought to be master of every implement, tool, and operation belonging to his profession; and if he find himself deficient in any particular, he should practise it day by day, until he make it familiar to him; or how is he to correct a bad workman; or to know when to be satisfied with a good one; who, knowing when he is right, will not bear the reproaches of ignorance? He has no other way of securing the esteem and attachment of good workmen, and of finishing in a workman-like manner every thing he undertakes, than by making himself master of his business; without which little satisfaction will arise from it to himself, or profit to his employer. And in the general principles of conduct, in his dealings and intercourse with other men, punctuality is one of the most essential. Method is the best assistant of punctuality; and clear accounts are one of the best results of method. These should always be kept with exactness, and be sent, when required, to the proprietor, in weekly, monthly, and annual periods, so as to shew the daily state of the work; the monthly state of receipts and payments; and, lastly, the whole state of accounts and balances.

Besides, it is extremely necessary for the farmer to be careful in providing his servants, not only to see that they are proper for the work, but that there be not more than are necessary for executing it, as the expence of them is now become extremely great. It has long since been recorded by the above writer, in his "Minutes of Agriculture," that on the maturest calculation he found the yearly expence of a man servant in the house to be 35*l.*, and that of a boy 23*l.*, supposing the man's yearly wages to be 10*l.* and the boy's 3*l.* Now the expence of a day-labouring man for a whole year (if he works every day) is but 27*l.* 10*s.*, which is 7*l.* 10*s.* difference against keeping a man in the house by the year, and hiring one by the day. But that of a boy is still more in proportion, *viz.* the expence of a day-labouring boy for a whole year, if he works every day, is but 13*l.*, which makes a difference of 10*l.*, or more than three-fourths of a boy's day-wages. In the above account, no deduction in the daily pay is made for rainy days. The impropriety, therefore, of keeping plough-boys in the house is very visible: and though it may be convenient to have the carters about the house, the convenience is not worth 7*l.* 10*s.* a-year. He therefore recommends putting a woman into a cottage, within about two hundred paces of the farm-yard, to take in lodgers; and to keep in the house no more

farming servants than a butler and a yardman. Indeed he says it is absolutely necessary to have somebody about a farm-yard in cases of emergency; but the above two are sufficient, as the carters in the adjoining cottage will be nearly as handy as if they were in the house. This measure, it is observed, like many others, is merely local, but the hint is universal.

But perhaps the farmer, who keeps no accounts, imagines he saves money by boarding his servants in the house; however, if he keeps them in the luxurious manner which farming-servants in general expect to be kept, he will be mistaken. A farmer, indeed, who sits at the head of his kitchen-table, may no doubt feed his men considerably cheaper, than a person who eats in a separate apartment. It is a just observation, that one fed by his master costs the community as much as two who provide for themselves; for discharge a grumbler, one who pretends to be dissatisfied; though in fact only fatiated, and he will return to his bread and cheese with perhaps equal health and equal happiness. He sits down to his master's table with a resolution to eat voraciously of the best, to do himself justice; but at his own table eats sparingly of the meanest, to save his money. His motive in both cases is the same; self-interest. The plan here inculcated is at this time still more necessary than it was at a former period.

And it is added, that in some counties, particularly in Surrey, it is an established custom for every man, in harvest, to work by the acre, or by the month, not by the day. If a labourer be constantly employed through the year, he expects during harvest to be constantly employed in mowing, reaping, &c. by the acre, or to have his harvest-month; that is, to have an advance of wages certain, wet or dry, during one month; which month commences when it best suits his employer. This is very convenient; they are always at command in cases of emergency; and nothing but a continuance of rains while the barns are empty can make them burdensome. He strongly recommends the employing of active young men; for one invalid or sluggish fellow will spoil the whole set; and this holds generally. Mix two or three old women, or two or three boys, with a company of men, and the effect will be very soon visible; for the men will soon conform to the ways of either the old women, or the playfulness of the boys. It is not prudent to employ many women with the men; and nothing but necessity can excuse it. Two women after the first or second day, will do as much work as half a dozen, alone. If it be necessary or convenient to employ a number of both men and women, it is but common good management to keep them separate; with this exception, which may be laid down as a maxim, *viz.* one man among women, and one woman among men. A crusty conceited old fellow will check the gossiping of the women, and it has been remarked that raking after a young wench has animated more than a gallon of ale. Two are dangerous; they breed contention, and rather retard than accelerate. The most valuable servant in harvest is a good carter. It is necessary to common management that he should be able, willing, and careful. Every pitch of hay and corn, generally speaking, passes twice through his hands; he loads and unloads, which are the two most laborious tasks of harvest; he drives the team backwards and forwards; if he loiters by the way, the field-men or stack-men must stand idle; if he spill or overturn his load, or if he break his waggon, or set his horses, the arrangement of the day is broken; and, perhaps, the damage done by the loss of time rendered irreparable by the next day's rain. A good carter will not suffer

SERVANT.

suffer his waggon to be overloaded. The field-men, too, that is, the pitcher and assistant-loader, should be young and active, and well matched with the carter.

But since the above was written, the prices of servants have considerably increased in every district of the kingdom, and the expences of keeping them been very greatly augmented. This has led to fewer being kept, and especially in the house. It is stated, that in Hertfordshire the annual wages of a carter or ploughman was formerly from six to nine guineas; boys from two to four guineas; and maid-servants about five guineas; but they have since risen to nearly double these sums. And formerly in Norfolk farm-work was particularly distinguished by the cheapness as well as expedition with which it was performed; which, it is said, arose not merely from the cheapness of labour, but the greater exertions of servants and labourers than in most other districts; but this is considerably diminished at present. In some parts of that district the custom of allowing board-wages to farm-servants, instead of the old plan of feeding them in the house, is coming into use; and 8s. a-week are given. This is a bad, immoral regulation, which should be discontinued. In Yorkshire the wages of servants have also been greatly increased. In the West Riding the wages of a house servant (of which kind most of the ploughmen are) may be estimated from 25l. to 30l. yearly, including maintenance. There is a practice which prevails over a considerable part of this district, of giving them drink both forenoon and afternoon, be the work what it will; which is a ridiculous custom, and ought to be abolished without loss of time. What can be more absurd than to see a ploughman stopping his horses half an hour, in a cold winter day, to drink ale? But the practice is so deep rooted, that it will not be easily removed without a compensation. It is suggested that the proper remedy is to let the value of the ale be paid to the servant in money, which probably would be as much for his interest, and certainly more advantageous to the farmer. In those places where long yokings are taken, say seven or eight hours, it may be necessary to feed both men and horses on the ground; but this practice cannot be recommended unless in urgent cases, it being very injurious to their health. In the best regulated agricultural counties, five hours labour in the morning and four hours in the afternoon, when the season allows, and five hours, or five hours and a half, in short days, is considered to be as much as horses are capable of sustaining, and yokings of this duration require no refreshment on the ground. And it is added, that the hours of labour for men are generally in summer from six to six, with the usual time for rest and refreshment, which gives betwixt nine and ten hours labour each day, and in winter from light to dark. Much of the farm-labour, such as ditching, hedging, threshing, &c. is done by the piece, but the prices vary greatly in different places. And it may be added that when the farmer is a proper judge of his business, piece-work is not only most to his advantage, but the only way by which an active diligent servant can be properly rewarded for his labour.

In Berkshire, and many other counties, great care is taken to keep no more servants in the house, by the farmers, than are just sufficient for performing the ordinary business to be done. The pay of a carter is there from nine to twelve guineas the year; an under carter from four to seven guineas for the same length of time; a shepherd from eight to ten guineas, and the run of a few sheep; a boy from two to three guineas; and a dairy-maid from five to ten guineas, in proportion as she may be qualified.

In the manufacturing districts of Cheshire and Lancashire, the wages of house-farming servants run in this way.

In the first,

	£	£
Man to follow the team -	from 10	to 12 <i>per annum.</i>
Lad of from 15 to 20, for the same purpose -	8	10
Cow boy, or man, as the stock may be -	8	12
Home-work servant, for hedging, mowing, threshing, &c. -	10	12
Head dairy woman, in proportion to the size of farm -	10	14
Women servants of other kinds -	4	6
Girls -	2	4

In the latter,

Men servants -	from 10	to 25
Lads -	6	10
Women -	5	8
Girls -	2	4

They have lately been considerably on the increase in both of these districts.

In the county of Essex, and many other districts which are principally agricultural, the work of the farms is in a great measure executed by hired daily or weekly labourers, very few yearly servants being kept by the farmers. This is supposed, in many instances, to be not only the cheapest, but the most convenient method of having such sorts of work performed; and the farmers are, at the same time, the most free from trouble in their houses and families. In the very southern agricultural districts of Devonshire and Cornwall, the wages of the farm servants, kept in the house, with washing and lodging, are, in the former, for a carter or head man ten pounds the year, the inferior sorts of farm business being often accomplished by parish apprentices; and in the latter, from eight to twelve guineas, with their board, for men, and from three to four pounds, with the same, for maid servants during the year. These rates, however, vary a little, according to the qualifications of the servants, and the nature of the situations and farms.

In the county of Herefordshire, where the hours of labour are from light to dark in the winter, and from six in the morning to the same hour in the afternoon, in summer, the following are the average prices of wages now given to servants kept in the house by the farmers.

Waggoner, -	10 to 12	guineas <i>per annum.</i>
Bailiff or cattleman, -	8 — 10	ditto.
Dairy-maid, -	6 — 7	ditto.
Under-maid, -	2 — 3	ditto.

Likewise in East Lothian, in Scotland, the wages are mostly from ten to fourteen pounds *per annum*; but this class of servants is but small. The female servants have from four pounds to four pounds ten shillings, or five pounds. And in Clydesdale, the greater part of the agricultural labour is performed by servants hired by the half year, and living in the farm-houses. In many parts of the county the women servants work along with the men, at almost all kinds of out-work. But as more hands than ordinary are needed for cutting down the corn in harvest, many husbandmen, to secure a fixed number for that purpose, when they can be got, contract with villagers to assist during the time of reaping. All these labourers have no fixed hours, but continue their labour while light and weather admit, and circumstances require. The poor girls, when light is gone and the men sit down by the fire, resume their household labours.

The

SERVANT.

The labourers, both men and women, are sometimes hired by the day, particularly in the time of planting, sowing, and hoeing turnips and potatoes, hay-making, and harvest, when a fixed number is not provided. These work only ten hours in the day, beginning at six in the morning and stopping at six at night, and taking an hour to rest at breakfast, and another at dinner. Hired labourers, in winter, take breakfast before they go out in the morning, make a short pause to eat a little at mid-day, and quit when light fails in the evening. The following are the prices of wages.

	Former.	Present.
Wages of men servants, besides bed, board, and washing, <i>per ann.</i>	from 13 <i>l.</i> to 16 <i>l.</i>	from 20 <i>l.</i> to 25 <i>l.</i>
Wages of a maid servant, besides bed, board, and washing, <i>per ann.</i>	— 5 <i>l.</i> to 7 <i>l.</i> or 8 <i>l.</i> to 9 <i>l.</i>	10 <i>s.</i>

But in Perthshire, a man servant, who is master of all the operations in farming, only receives, in the corn country, between eight and twelve pounds, for twelve months. In the grazing districts, more remote from the seat of manufactures, their wages, and the price of all kinds of labour, are about one-fourth lower. But in many cases the servants are maintained in the farmer's family; but the practice of giving them six and a half bolls of meal, together with a house, garden, and a cow's grass, free of rent, and some fuel, is daily becoming more general. These farmers, who keep any married servants, have them all on this establishment of livery meal. The maid servants live all in their master's family, and are engaged for betwixt three and four pounds, and in some cases five pounds of yearly wages, according to their expertness, and the nature of their work. But common labourers earn between one shilling and one shilling and three-pence a day; and if able-bodied and handy, they demand one shilling and sixpence, without victuals. The various denominations of artificers charge according to the nicety of their art. The hours of labour from the vernal to the autumnal equinox, are from six to six, allowing an hour for breakfast and another for dinner; and during the other half year, from the dawn of day till the light fails at night, with an allowance of one hour for breakfast. Household servants are not so exact with respect to hours; in the long days, they continue to work after six at night; and in short days they get out of bed before day light, where there is much grain to thrash. But in many of the large farms, thrashing machines have been erected; and they are such a great saving, by the abridgment of labour, that more of them are set up every year, in different parts of the county.

And in Argyleshire, within these 30 years, the price of labour is somewhat more than doubled. It still varies in different parts of the county, but may be estimated in general at the following rates. A man servant's wages, *per annum*, with victuals, from 6*l.* to 8*l.* A maid servant's, from 5*s.* to 4*l.* And that since 1795 the wages and the price of labour have been advanced more than one fourth, or from 25 to 30 *per cent.*, and are still rising.

Further, in regard to the regulating the rate of wages, it has been suggested in the Agricultural Survey of the West Riding of Yorkshire, that the only mode of making them proportional to the rise or fall on the value of money and provisions, is to pay the labourer in kind, that is, with a certain quantity of corn, as parties shall agree, which insures him, at all hazards, a comfortable subsistence, and prevents him from a daily or weekly visitation of the markets. When

the labourer is paid in money, it exposes the thoughtless and inattentive to many temptations; whereas, when paid in kind, he cannot raise money to gratify the whim of the moment. In those counties where this mode of payment has been long established, we believe the ploughmen and labourers are, on the whole, better fed, live more comfortably, and rear healthier children than in those parts where, from being paid in money, the currency of the article facilitates the expenditure, and prevents him from laying by a stock of provisions for his support, when laid off work by casualties or distress. In the part of the kingdom where the writer resides, nearly all farm-servants are paid in this manner. They have a certain quantity of grain, maintenance for a cow summer and winter, a piece of ground for planting potatoes and raising flax, and whatever fuel they require, given gratis. These, with the privilege of keeping a hog and a few hens, enables them to live, and bring up their families in a comfortable manner; and, while their income is considerably less than people of their station in other parts, they are, on the whole, better fed, better dressed, and enabled to give a better education to their children. Placed under these circumstances, they are a respectable set of men; and, for frugality, faithfulness, and industry, they will bear a comparison with their brethren in any quarter. The introduction of a similar mode of paying farm-servants into the West Riding, is therefore recommended, which, although it might at first be attended with some difficulties, would contribute to the public good, and to the advantage of the labouring peasantry in many respects. And it is remarked in the Herefordshire Agricultural Survey, that if a certain proportion between the price of labour and the average price of wheat could be fixed by law, so as to render the applications for parochial aid necessary only in cases of very large families, of unusual illness, of scanty seasons, or any other real emergency; the measure, it is presumed, would stimulate industry and fidelity, would check dishonesty, and endear to a numerous class their native soil.

The advance in the rate of farm-servants' wages who live in the houses of the farmers, has, within the last twenty-five years, been probably not less than from a third to a fourth of the whole, according to the nature and situation of the district, over the whole country; but how far the agricultural and manufacturing state of the nation may thereby be affected, is difficult to determine.

It is a matter of very great consequence to farmers, to have good, tractable, intelligent, able, and honest servants, as no sort of good farm-work, or improvements, can be properly carried on without them.

SERVANTS' Rooms, in *Rural Economy*, the lodging places for farm-servants, which should always, if possible, be distinct from the house upon farms of considerable size. And in cases of very extensive farms, and of course where many servants are required, especially if they be unmarried, proper and convenient accommodations for sleeping, and where they find their own provisions, for preparing and dressing them in, are not only requisite, but highly advantageous, both to the farmer and the men, as saving much time, which would otherwise be lost in going to their meals, and keeping them together sober, steady, and ready for their different employments. And in this way the servants are much more comfortable, and live considerably cheaper than where it is the custom to go to public houses, or other such places for their meals, which is too much the case in many of the more southern districts of the kingdom, by which their manners often become depraved, and their constitutions enfeebled by the great use of spirits, and other intoxicating liquors, which they are almost necessitated to take under

under such circumstances. But these inconveniences are perhaps the most effectually guarded against by such servants being provided for, where it can be done, from the tables of the farmers. But where this last method is followed, the eating rooms should be so situated, that they may be overlooked with facility. Their lodging rooms, in all cases, are the most proper and the safest, when made in a building quite detached and distinct from the other houses and offices; as persons of this description are often extremely negligent of their fires, candles, &c., as well as irregular in other parts of their conduct. It has been advised, that whatever situation may be fixed upon for these conveniences, the ground-floors should always be of stone or brick, and the upper ones made with plaster, as is done in some of the midland counties, or brick, which is more easily laid. See *PLASTER Floors*.

Most kinds of farm labour may, however, probably at present be performed more cheaply by other sorts of workmen, than servants provided for in any of these ways.

SERVE, in the *Sea Language*. To *serve* a rope, is to lay spun-yarn, rope-yarn, fennit, a leather, a piece of canvas, or the like upon it, which is rolled fast round about the rope, to keep it from fretting or galling in any place.

SERVERETTE, in *Geography*, a town of France, in the department of the Lozere; 12 miles N.N.W. of Mende.

SERVETISTS, in *Ecclesiastical History*, a sect said to be the disciples or followers of Michael Servetus, the ring-leader of the Anti-Trinitarians of these last ages. See his article.

It is impossible (says the translator of Mosheim's Eccl. Hist.) to justify the conduct of Calvin in the case of Servetus, whose death will be an indelible reproach upon the character of that great and eminent reformer. The only thing that can be alleged, not to efface, but to diminish his crime is, that it was no easy matter for him to divest himself at once of that persecuting spirit, which had been so long nourished or strengthened by the popish religion in which he was educated.

Servetus, in reality, had not any disciples, as being burnt, together with his books, before his dogmas had time to take root. But the name Servetists has been given to some of the modern Anti-Trinitarians, because they follow the footsteps he had marked out.

However, those who were denominated Servetists, or Servetians, by the theological writers of the sixteenth century, not only differed from Servetus in many points of doctrine, but also varied widely from him in his doctrine of the Trinity, which was the peculiar and distinguishing point of his theological system.

Sixtus Senensis calls the Anabaptists Servetists, and seems to use the two terms indifferently. The truth is, in many things, the ancient Anabaptists of Switzerland, &c. coincide in opinion with Servetus.

As the books that he wrote against the Trinity are very rare, his real sentiments are but little known: M. Simon, who had a copy of the first edition, delivers them at large in his critical history.

Though Servetus uses many of the same arguments against the Trinity as the Arians, yet he professes himself very far from their sentiments. He also opposes the Socinians in some things; and declares his dissent from the opinions of Paulus Samofatenus; though Sandius mistakenly charges him with having the same sentiments.

In effect, he does not seem to have had any fixed regular

system of religion, at least not in the first edition of his book against the Trinity, published in 1531, under the title "De Trinitatis Erroribus Libri septem, per Michaelum Servetum, alias Reves, ab Arragonia Hispanum."

The year following he published his dialogues on the mystery of the Trinity. In the preface to which last work he declares himself dissatisfied with it. It was on this account he undertook another on the same subject, of much greater extent, which did not appear till the year 1553, a little before his death, under the title of "Christianismi Restitutio."

Those of Geneva, having seized the copies of this edition, had it burnt; nor were there above two or three that escaped; one of which was kept at Basil, where the book was printed, but is now in the college library at Dublin.

It was put to the press secretly in England, but being discovered, the impression was seized and destroyed.

Servetus, according to Mosheim's account, conceived that the genuine doctrine of Christ had been entirely lost, even before the council of Nice; and he was moreover of opinion, that it had never been delivered with a sufficient degree of precision in any period of the church. To these extravagant assertions he added another still more so, even that he himself had received a commission from above to reveal anew this divine doctrine, and to explain it to mankind. His notions with respect to the Supreme Being, and a Trinity of persons in the godhead, were very obscure and chimerical, and amounted in general to the following propositions: that the Deity, before the creation of the world, had produced within himself two personal representations or manners of existence, which were to be the medium of intercourse between him and mortals, and by whom, consequently, he was to reveal his will, and to display his mercy and beneficence to the children of men: that these two representatives were the Word and the Holy Ghost: that the former was united to the man Christ, who was born of the Virgin Mary, by an omnipotent act of the Divine Will; and that, on this account, Christ might be properly called *God*: that the Holy Spirit directed the course, and animated the whole system of nature, and more especially produced in the minds of men wise counsels, virtuous propensities, and divine feelings; and, finally, that these two representations were to cease after the destruction of this terrestrial globe, and to be absorbed into the substance of the Deity, from whence they had been formed.

Servetus, however, did not always explain his system in the same manner, nor avoid inconsistencies, contradictions, and ambiguities; so that it is extremely difficult to learn his true sentiments. His system of morality agreed in many circumstances with that of the Anabaptists, whom he also imitated in censuring with the utmost severity the custom of infant-baptism. Eccl. Hist. vol. iv. 1768.

SERVETUS, MICHAEL, in *Biography*, was born at Villanueva, in Arragon, in 1509. His father was a notary-public, and he himself was sent to the academy of Toulouse, where he studied the law during the space of three years. About this period his attention was turned to the study of the sacred scriptures, to which he was probably excited by the reformers of that day. He soon discovered many errors and abuses in the church of Rome, in the tenets of which he had been brought up, and laid then the foundation of his opinions concerning the doctrine of the Trinity. It is known, that at this period, many learned men in Italy and other parts, among whom were some dignitaries

of the church, condemned in private the reigning superstitions, to which, however, they readily conformed in public. Whether Servetus was instructed by any of these, or whether his own opinions were the result of investigation, cannot be ascertained: it is certain, that he did not think it prudent to divulge them in France, and therefore retired to Germany, where a much greater liberty of conscience was allowed and asserted, and where several princes secretly favoured the bold attacks on the popedom. He went through Lyons and Geneva to Switzerland, and fixed his residence at Basil in the year 1530. Here he was on a footing of friendly intimacy with Œcolampadius, with whom he often conversed about various religious topics, but to whose peculiar opinions he would not yield, in the smallest degree, any notions which he had previously adopted. The unbending disposition with regard to matters of small moment, alienated many persons from Servetus who had formed a high opinion of his talents and integrity. While he was at Basil, he put into the hands of a bookseller a manuscript, "*De Trinitatis Erroribus*," which was printed in the year 1531. Servetus now went to Strasburg, in which city he became acquainted with two reformers, *viz.* Capito and Bucerus. Here he searched for opportunities to communicate his religious tenets to his new acquaintances, and here he learned that his work had excited a considerable sensation among people of all classes. He was aware that he had, in many respects, treated the subject too imperfectly; and had made use of expressions that were liable to give offence; he accordingly, in the following year, endeavoured to soften the unfavourable impression, and to avert a storm that seemed threatening to fall upon him, by publishing a work entitled "*Dialogorum de Trinitate Libri duo*," in which he explained and defended his opinions. The consequences of this second piece was, that many were exasperated against the author, while a few adopted his doctrines and spread them abroad. Œcolampadius requested his friend Bucer to inform Luther, that Servetus's book had been published without their knowledge, in order that it might not be supposed they had given any countenance to the propagation of the offensive tenets. And Melancthon, in speaking at this time of Servetus, says, "He wants neither acuteness nor cunning in disputing, but I cannot allow him energy. He has, moreover, as it appears to me, confused imaginations, neither is he able sufficiently to explain his thoughts with precision. He unquestionably speaks like a madman about justification; about the Trinity, *τρεῖς τρεῖς ἄνδρες*, you know that I have been always apprehensive that similar things sooner or later would break out. Good God! what tragedies will this question excite among posterity."

The circumstances of Servetus being low, he engaged for some time with the Frellons, eminent booksellers at Lyons, as corrector of the press. From Lyons he went to Paris, where he studied physic under the celebrated Sylvius, Fernelius, and other professors; and, as we shall have occasion to remark hereafter, he carried into that science the same penetrating spirit and love of improvement which distinguished him in theology. He graduated at Paris, and being invested with this honour, he delivered public lectures in geography and some branches of mathematics, while he followed the profession of a physician. At Paris he quarrelled with the faculty, and wrote an "*Apology*," which was suppressed by the parliament. After quitting that capital he practised physic at Charlieu, near Lyons, whence, at the invitation of the archbishop of Vienne, he removed to that city, and had apartments near

the palace. He had, previously to this, *viz.* in 1542, superintended the printing of a Latin Bible at Lyons, to which he added marginal notes, under the name of Villanovanus.

During this time, Servetus was in constant correspondence with Calvin, with whom he discussed various points of controversy, and to whom he opened himself freely and without reserve concerning his particular notions, and consulted him respecting his writings. Calvin afterwards made a base use of this confidence, by actually producing his letters and manuscripts as matter of accusation against him on his trial. It must not, however, be concealed, that Calvin does not appear to have encouraged Servetus to this exposition of his sentiments, for he frequently sent him in reply angry and severe letters. In 1553, Servetus published his matured theological system under the title of "*Christianismi Restitutio*." Conscious of the danger to the author of such a work in a Catholic country he concealed his name, but Calvin took care that the magistrates of Vienne should be informed of it. He was in consequence thrown into prison, and his death would have added an example to the numberless cruelties of Roman Catholic persecutions, had he not made his escape. His effigy and his books were condemned to the flames. Servetus, purposing to go to Naples to practise in his profession, imprudently went through Geneva. Calvin, who was acquainted with the plans of the traveller, and who was on the watch to entrap him, gave information to the magistrates the moment he arrived within the gates of the city. He was accordingly seized, thrown into prison, and a charge of blasphemy and heresy was preferred against him by Calvin's own servant. In order to ensure conviction and condemnation, no less than thirty-eight articles of accusation were brought against him, for which not only his last work, but all his other writings were ransacked. As a proof of the malice and unfairness with which he was treated, it is mentioned that one of the charges was extracted from his preface to an edition of Ptolemy's Geography, published twenty years before, in which he had asserted, that Judea had been falsely extolled for its beauty and fertility, since modern travellers had found it to be sterile and unfitly. That no doubt might be left whence the prosecution came, one of the main articles against the prisoner was, that in the person of Mr. Calvin, minister of the word of God in the church of Geneva, he had defamed the doctrine preached in it, uttering all imaginable injurious and blasphemous words against it.

Servetus, in the first examination, repelled with firmness every accusation, though he avowed that he published in Germany his book "*De Trinitatis Erroribus*;" in France his "*Restitutio Christianismi*," together with Ptolemaeus, and the edition of Pagnini's bible. At the second examination, he acknowledged, when urged to confess the truth, some of the articles brought against him in regard to his publications, denied others, and hesitated to explain himself more plainly upon others. But when he was again questioned, "why he had slandered Calvin, and lacerated the Christian doctrine?" he protested that Calvin had been the aggressor, and that if he had recriminated it was done in self-defence; which plea was deemed by his judges as an aggravation of his offence.

The magistrates of Geneva were, however, sensible that many eyes were upon them in this extraordinary proceeding, with respect to one who was no subject of their's, nor a resident in their city, nor could he be accused of having committed any offence in their territory, and within their jurisdiction. He was, in truth, kidnapped in his passage.

Moreover,

Moreover, it could not but appear strange, that men should be associates in persecution, with those very people who would infallibly burn them as heretics, should they fall into their hands. They therefore thought it advisable to consult the magistrates of the Protestant cantons of Switzerland, to whom they sent Servetus's book, with Calvin's reply. The Helvetic divines, to whom the matter was referred, unanimously declared for his punishment: they said that Servetus's errors ought to be detested, and that great care ought to be taken that the infection spread no farther, and that the man ought to be restrained; but they, none of them, said a word respecting capital punishment, nor do they allude to the kind of coercion that should be chosen. Their meaning was, however, readily inferred from their own practice; for the capital punishments of heretics had not been abolished in Switzerland; they had been frequently practised at Zurich against the Baptists.

Servetus was for a time kept ignorant of all the proceedings against him; at length he discovered the intentions of his enemies, and drew up, and caused to be presented, two petitions to his judges: in the first he endeavoured to exculpate himself; in the second he complained that a fair trial had not been allowed him. As he refused to retract his opinions, he was, notwithstanding his pleas, condemned to the flames as an obstinate heretic, which cruel sentence was carried into execution on the 27th of October 1553, when he was in the forty-fourth year of his age. His sufferings were particularly severe, and the fire was so managed, that the unfortunate man lingered in excruciating pain more than two hours.

That this bloody persecution was disapproved by many at the time, is rendered very probable by the apology for the Genevan magistrates, published by Calvin, in which he undertook to prove that it was lawful to punish heretics with death. The mild and otherwise moderate and benevolent Melancthon sanctioned the deed by a congratulatory letter addressed to the magistrates of Geneva. The conduct of Calvin in this business, as instigated not only by bigotry, but personal hatred, has impressed an indelible stain on his memory; and the only possible excuse now offered for it arises from the provocation given by Servetus, "whose excessive arrogance," according to Mosheim, "was accompanied with a malignant and contemptuous spirit, and an invincible obstinacy of temper."

The theological system of Servetus is described as singular in the highest degree. The greatest part of it was a necessary consequence of his peculiar notions concerning the universe, the nature of God, and the nature of things, which were equally strange and chimerical. See the article **SERVETISTS**.

Servetus is numbered among those anatomists who made the nearest approach to the doctrine of the circulation of the blood. The passage cited to this effect is contained in his latest and fatal work, "*De Restitutione Christianismi*." It clearly states the circulation of the blood through the lungs. He pursued, in his medical studies, anatomical researches with the greatest ardour.

Servetus was a man of great erudition and unfeigned piety: his mind was stored with a variety of knowledge, and he stood very high, in the estimation of his contemporaries, for his talents and for his discoveries in the profession of medicine. Whatever might have been his errors as a theologian, it is certain he never preached them to the vulgar, but communicated them freely to Calvin, Œcolampadius, Capito, Bucerus, and other reformers, with an eagerness to discover truth which has never been surpassed.

The atrocious murder committed on him will not ad-

mit of a single excuse. His imprisonment was scandalous and unjust. The senate of Geneva had no right to lay violent hands upon a traveller, who had no intention of remaining in their city, and who probably never uttered within the precincts of their dominions one syllable of his obnoxious opinions. Here Geneva stands condemned by all civilians.

The affability of the manners of Servetus, and his vast learning, had procured him numerous friends in France, in Germany, and in Italy: and his name will be handed down to the latest posterity with commiseration and respect. See a life of Servetus, in a series of letters to Jedidiah Morse, D. D., by Fr. Adrian Vanderkemp: inserted in vol. v. of the *Monthly Repository*.

SERUG, in *Geography*, a town of Asiatic Turkey, in the province of Diarbekir; 12 miles S. of Ourfa.

SERUGNANO, a town of Italy, in the Veronese; 8 miles E.N.E. of Verona.

SERVIA, a province of Turkey in Europe, part of the ancient Pannonia, or of Turkish Illyria, deriving its name from its inhabitants, is bounded on the N. by Bosnia and Slavonia, on the E. by Walachia and Bulgaria, on the S. by Macedonia and Albania, and on the W. by Bosnia and Dalmatia. It was formerly divided into Proper Servia, or Serbia, and Rascia, and the inhabitants were distinguished into Servians, and Rascians or Reitzes; and the former, which constitutes the upper part, towards the Danube, belongs to the bannat of Masovia. The capital of Servia is Belgrade, (which see). The Turks call it *Lafs Vilayeti*, or Lazarus-land, because in the year 1365, when they subdued it, Lazarus was prince of Serbia. See **SERVIAN**.

SERVIAN, a town of France, in the department of the Herault, and chief place of a canton, in the district of Beziers; 6 miles N.E. of Beziers. The place contains 2200, and the canton 7319 inhabitants, on a territory of 117½ kilometres, in 9 communes.

SERVIAN, or **SERBES**, a branch of the Illyrian Slavi, who gave name to the province called Servia or Serbia. In the Russian empire the Servians and Reitzes are colonists, to whom, in the year 1754, a considerable district was allotted on the Dnieper near and upon the possessions of the Zaporagian Cossacks. This country, which got the name of New Servia, was for the most part an uninhabited desert, extending to what were then the Polish borders, by which it was surrounded on three sides. The Servians, who voluntarily settled here in great numbers, were formed into a military association, to be a check upon the dissensions and excesses of the Zaporagians. In the year 1764, the whole of this tract of country was erected into the government of New Russia, and at present forms a considerable part of the province of Ekaterinoslaf.

SERVICE, or **SERVAGE**, *Servitium*, in *Law*, a duty which the tenant, by reason of his fee, owes to the lord.

This, in pure, proper, and original feuds, was only twofold; to follow, or to do suit to, the lord in his courts in time of peace; and in his armies, or warlike retinue, when necessity called him to the field.

Ancient law-books make several divisions of service, *viz.* into *personal*, *real*, and *mixt*; *military* and *base*, *intrinsic* and *extrinsic*, &c. But, since the statute 12 Car. II., by which all tenures are turned into free and common socage, much of that learning is set aside. Yet it may not be amiss to mention how the several kinds of service are described in our ancient law-books.

SERVICE, *Personal*, is that to be performed by the person. Such is that due from a slave to his master.

Personal service is a disgraceful sort of tenure, under which lands were formerly held, and in which the tenant did various sorts of work for the lord, and provided him with a variety of different articles. It is a custom which has long been abolished in this part of the kingdom, as being highly injudicious and improper; but which, Mr. Donaldson remarks, is not wholly discarded in Scotland. "In the north of Scotland," says he, "the rents are to a certain extent paid in personal services; the tenants being bound to plow and harrow a certain proportion of the proprietor's farm; to reap, carry home, thrash, dress, and mill a certain quantity of his crop at their own charges; and that they are also bound to pay poultry, eggs, cheese, sheep, swine, fish, linen, yarn, &c." It might, continues he, have been unavoidably necessary, from the want of a circulating medium in the early periods of the history of this country, to oblige the tenants to pay their rents in personal services, and in the various articles of produce which their farms afforded; but it must be considered a singular circumstance in the history of Great Britain, that in the end of the eighteenth century, and at a period when the introduction of improvements in agriculture is the chief topic of conversation, there should exist proprietors, who are so lost to every sentiment regarding what is due to the community of which they are members, to the people whom Providence has placed under their protection, and to the improvement of their native country, as to persist in demanding from their tenants a species of rent, which no farmer, who is entitled to the name, would submit to pay, nor any proprietor, who regarded the good of his country, or his own interest, think of requiring. These disgraceful services should of course be done away with in every situation, as being incompatible with all sorts of improvements in husbandry, or the introduction of spirited agriculture into any part.

This sort of service is not only hostile to all kinds of farming improvements, but highly distressing and ruinous to tenants at particular seasons, as during the seed-time, the harvest, and the time of getting in the hay, by being often under the necessity of neglecting their own operations and businesses, in order to perform the various works of their lords, or superiors. The sooner these services are wholly abolished in every part of the kingdom, the better it will be for the interests of agriculture.

SERVICE, *Real*, is either *urbane* or *rustic*; which two kinds differ, not in the place, but the thing. The first is that due from a building or house, in whatever place situate, whether in city or in country, as keeping a drain, a vieta, or the like.

SERVICES, *Rustic*, are those due for grounds, where there is no building; such is the right of passage through ways, &c.

SERVICE, *Mixt*, is that due from the person, by reason of the thing, as an usufruct, &c.

Our ancient law-books tell us of lands held of the king, by the tenant's letting a fart before the king on New Year's Day; others, by furnishing the king with whores, whenever he travelled that way; others, by bringing the king a mess of pottage at his coronation-feast, &c.

There are also *natural* services. For instance, if a man cannot gather the produce of his lands, without passing through his neighbour's grounds, the neighbour is obliged to allow a passage, as a natural service.

SERVICE, *Forensic* or *Extrinsic*, *Servitium forensicum*, &c. was a service which did not belong to the chief lord, but to the king.

It was called *forensic* and *extrinsic*, because done *foris*,

out of doors; and *extra servitium*. We meet with several grants, in the Monasticon, of all liberties, with the appurtenances, *salvo forensi servitio*.

SERVICE, *Intrinsic*, *Servitium intrinsicum*, that due to the chief lord alone, from his vassals within his manor.

SERVICE, *Frank*, *Servitium liberum*, a service done by the feudatory tenants, who were called *liberi homines*, and distinct from vassals: as was likewise their service; for they were not bound to any base services, as to plow the lord's lands, &c. but only to find a man and horse to attend the lord into the army or court.

SERVICE, *Base*. See VILLENAGE.

SERVICE, *Bord*. See BORDAGE.

SERVICE, *Foreign*, *Honorary*, *Knights*, *Rent*. See the adjectives.

SERVICE, *Herist*. See HERIOT.

SERVICE, *Ovelty* of. See OVELTY.

SERVICE, *Suit* of. See SUIT.

SERVICE, *Choral*, in *Church History*, denotes that part of religious worship which consists in chanting and singing. The advocates for the high antiquity of singing, as a part of church music, urge the authority of St. Paul in its favour: Ephes. chap. v. ver. 9. and Coloss. chap. iii. ver. 16. On the authority of which passages it is asserted, that songs and hymns were, from the establishment of the church, sung in the assemblies of the faithful; and it appears, from undoubted testimony, that singing, which was practised as a sacred rite among the Egyptians and Hebrews, at a very early period, and which likewise constituted a considerable part of the religious ceremonies of the Greeks and Romans, made a part of the religious worship of Christians, not only before churches were built, and their religion established by law, but from the first profession of Christianity. However, the era from whence others have dated the introduction of music into the service of the church, is that period, during which Leontius governed the church of Antioch, i. e. between the year of Christ 347 and 356. See ANTI-PHONY.

From Antioch the practice soon spread through the other churches of the East; and in a few ages after its first introduction into the divine service, it not only received the sanction of public authority, but those were forbid to join in it who were ignorant of music. A canon to this purpose was made by the council of Laodicea, which was held about the year 372; and Zonaras informs us, that these canonical singers were reckoned a part of the clergy. Singing was introduced into the western churches by St. Ambrose, about the year 374, who was the institutor of the Ambrosian chant, established at Milan about the year 386; and Eusebius (lib. ii. cap. 17.) tells us, that a regular choir, and method of singing the service, were first established, and hymns used in the church at Antioch, during the reign of Constantine; and that St. Ambrose, who had long resided there, had his melodies thence. This was, about two hundred and thirty years afterwards, amended by pope Gregory the Great, who established the Gregorian chant; a plain, unisonous kind of melody, which he thought consistent with the gravity and dignity of the service to which it was to be applied. This prevails in the Roman church even at this day: it is known in Italy by the name of *canto fermo*; in France, by that of plain chant; and in Germany, and most other countries, by that of the *cantus Gregorianus*. Although no satisfactory account has been given of the specific difference between the Ambrosian and Gregorian chants, yet all writers on this subject agree in saying, that St. Ambrose only used the four authentic modes, and that the four plagal were afterwards

added by St. Gregory. Each of these had the same final, or key-note, as its relative authentic; from which there is no other difference than that the melodies in the four authentic, or principal modes, are generally confined within the compass of the eight notes *above* the key-note, and those in the four plagal, or relative modes, within the compass of the eight notes *below* the fifth of the key. See *MODE*.

Ecclesiastical writers seem unanimous in allowing, that pope Gregory, who began his pontificate in 590, collected the musical fragments of such ancient psalms and hymns as the first fathers of the church had approved and recommended to the first Christians; and that he selected, methodized, and arranged them in the order which was long continued at Rome, and soon adopted by the chief part of the western church. Gregory is also said to have banished from the church the *canto figurato*, as too light and dissolute; and it is added, that his own chant was called *canto fermo*, from its gravity and simplicity.

It has been long a received opinion, that the ecclesiastical tones were taken from the reformed modes of Ptolemy; but Dr. Burney observes, that it is difficult to discover any connection between them, except in their names; for their number, upon examination, is not the same; those of Ptolemy being seven, the ecclesiastical eight; and, indeed, the Greek names given to the ecclesiastical modes do not agree with those of Ptolemy in the single instance of key, but with those of higher antiquity. From the time of Gregory to that of Guido, there was no other distinction of keys than that of authentic and plagal; nor were any semi-tones used but those from E to F, B to C, and occasionally A to B.

With respect to the music of the primitive church, it may be observed, that though it consisted in the singing of psalms and hymns, yet it was performed in many different ways; sometimes the psalms were sung by one person alone, whilst the rest attended in silence; sometimes they were sung by the whole assembly; sometimes alternately, the congregation being divided into separate choirs; and sometimes by one person, who repeated the first part of the verse, the rest joining in the close of it.

Of the four different methods of singing now recited, the second and third were properly distinguished by the names of *symphony* and *antiphony*; and the latter was sometimes called *responsaria*, in which women were allowed to join. St. Ignatius, who, according to Socrates (lib. vi. cap. 8.), conversed with the apostles, is generally supposed to have been the first who suggested to the primitive Christians in the East the method of singing hymns and psalms alternately, or in dialogue; and the custom soon prevailed in every place where Christianity was established; though Theodoret, in his History (lib. ii. c. 24.), tells us, that this manner of singing was first practised at Antioch. It likewise appears, that almost from the time when music was first introduced into the service of the church, it was of two kinds, and consisted in a gentle inflection of the voice, which they termed plain song, and a more elaborate and artificial kind of music, adapted to the hymns and solemn offices contained in its ritual; and this distinction has been maintained even to the present day.

Although we find a very early distinction made between the manner of singing the hymns and chanting the psalms, it is, however, the opinion of the learned Martini, that the music of the first five or six ages of the church consisted chiefly in a plain and simple chant of unisons and octaves, of which many fragments are still remaining in the *canto fermo* of the Romish missals. For with respect to

music in parts, as it does not appear, in these early ages, that either the Greeks or Romans were in possession of harmony or counterpoint, which has been generally ascribed to Guido, a monk of Arezzo, in Tuscany, about the year 1022; though others have traced the origin of it to the eighth century, it is in vain to seek it in the church. The choral music, which had its rise in the church of Antioch, and from thence spread through Greece, Italy, France, Spain, and Germany, was brought into Britain by the singers who accompanied Austin the monk, when he came over, in the year 596, charged with a commission to convert the inhabitants of this country to Christianity. Bede tells us, that when Austin and the companions of his mission, had their first audience of king Ethelbert, in the isle of Thanet, they approached him in procession, singing litanies; and that afterwards, when they entered the city of Canterbury, they sung a litany, and at the end of it, Allelujah. But though this was the first time the Anglo-Saxons had heard the Gregorian chant, yet Bede likewise tells us, that our British ancestors had been instructed in the rites and ceremonies of the Gallican church by St. Germanus, and heard him sing Allelujah many years before the arrival of St. Austin. In 680, John, præcentor of St. Peter's in Rome, was sent over by pope Agatho to instruct the monks of Weremouth in the art of singing; and he was prevailed upon to open schools for teaching music in other places of Northumberland. Benedict Bishop, the preceptor of Bede, Adrian the monk, and many others, contributed to disseminate the knowledge of the Roman chant. At length the successors of St. Gregory, and of St. Austin his missionary, having established a school for ecclesiastical music at Canterbury, the rest of the island was furnished with masters from that seminary. The choral service was first introduced into the cathedral church of Canterbury, and, till the arrival of Theodore, and his settlement in that see, the practice of it seems to have been confined to the churches of Kent; but after that, it spread over the whole kingdom; and we meet with records of very ample endowments for the support of this part of public worship. This mode of religious worship prevailed in all the European churches till the time of the Reformation: the first deviation from it is that which followed the reformation by Luther, who being himself a lover of music, formed a liturgy, which was a musical service, contained in a work, entitled, "*Psalmodia, h. e. Cantica sacra Veteris Ecclesiæ selecta*," printed at Norimberg in 1553, and at Wittenberg in 1561. But Calvin, in his establishment of a church at Geneva, reduced the whole of divine service to prayer, preaching, and singing; the latter of which he retrained. He excluded the offices of the antiphon, hymn, and motet, of the Romish service, with that artificial and elaborate music to which they were sung; and adopted only that plain metrical psalmody, which is now in general use among the reformed churches, and in the parochial churches of our own country. For this purpose he made use of Marot's version of the Psalms, and employed a musician to set them to easy tunes only of one part. In 1553, he divided the Psalms into pauses or small portions, and appointed them to be sung in churches. Soon after they were bound up with the Geneva catechism, from which time the Catholics, who had been accustomed to sing them, were forbid the use of them, under a severe penalty. Soon after the reformation commenced in England, complaints were made by many of the dignified clergy, and others, of the intricacy and difficulty of the church music of those times: in consequence of which it was once proposed, that organs and curious singing should be removed from our churches.

Latimer,

Latimer, in his diocese of Worcester, went still further, and issued injunctions to the prior and convent of St. Mary, forbidding in their service all manner of singing. In the reign of Edward VI. a commission was granted to eight bishops, eight divines, eight civilians, and eight common lawyers, to compile a body of such ecclesiastical laws as should in future be observed throughout the realm. The result of this compilation was a work, first published by Fox the Martyrologist, in 1571, and afterwards in 1640, under the title of "Reformatio Legum Ecclesiasticarum." These thirty-two commissioners, instead of reprobating church music, merely condemned figurative and operose music, or that kind of singing which abounded with fugues, responsive passages, and a commixture of various and intricate proportions; which, whether extemporary or written, is by musicians termed *descant*. However, notwithstanding the objections against choral music, and the practice of some of the reformed churches, the compilers of the English liturgy, in 1548, and the king himself, determined to retain musical service. Accordingly the statute 2 & 3 Edw. VI. cap. 1. though it contains no formal obligation on the clergy, or others, to use or join in either vocal or instrumental music in the common prayer, does clearly recognize the practice of singing; and in less than two years after the compiling of king Edward's liturgy, a formula was composed, which continues, with scarcely any variation, to be the rule for choral service even at this day. The author of this work was John Marbecke, or Marbecke; and it was printed by Richard Grafton, in 1550, under the title of the Book of Common Prayer, noted. Queen Mary laboured to re-establish the Romish choral service; but the accession of Elizabeth was followed by the act of uniformity; in consequence of which, and of the queen's injunctions, the Book of Common Prayer, noted by Marbecke, was considered as the general formula of choral service. In 1560, another musical service, with some additions and improvements, was printed by John Day; and in 1565, another collection of Offices, with musical notes. Many objections were urged by Cartwright, and other Puritans, against the form and manner of cathedral service, to which Hooker replied, in his Ecclesiastical Polity. In 1664, the statutes of Edward VI. and Elizabeth, for uniformity in the common prayer, were repealed; and the directory for public worship, which allows only of the singing of psalms, established. But upon the restoration of Charles II. choral service was again revived, and has since uniformly continued. The Quakers object to singing as a part of public worship, and accordingly it is never practised in their meetings. To this respectable body we here make an apology for a *jeu d'esprit* of our learned coadjutor, Dr. B., who compiled part of the article LITURGY, which escaped him, notwithstanding his well-known liberality and candour, and which was undoubtedly unseasonably introduced, in an account of their public worship. Religious scruples, though in some respects unfounded and unwarrantable, when seriously avowed, are not fit subjects of ridicule. See on this subject Hawkins's Hist. of Music, vol. i. p. 404. vol. ii. p. 264. vol. iii. p. 58—468, &c. vol. iv. p. 44—347. Burney's Hist. Mus. vol. ii. ch. i. passim.

SERVICES of the Church. (See CATHEDRAL SERVICES.) These have been collected, and splendidly and accurately published in score, by doctors Green, Boyce, and Arnold. These valuable publications appeared in the following order, and are reputable monuments of the abilities of our old masters in the ecclesiastical style of composition, equal, at least, to contemporary productions by the greatest contrapuntists on the continent.

CATHEDRAL MUSIC; being a collection in score of the most valuable and useful compositions for the service by the several English masters of the last 200 years, the whole selected and carefully revised by Dr. William Boyce, organist and composer to the royal chapels, and master of his majesty's band of musicians. Vol. i. 1760.

The second volume was published in 1768, and the third in 1773. These were both dedicated to his majesty.

In 1780, Dr. Samuel Arnold, organist and composer to his majesty's royal chapels, published, in the same splendid manner, a first volume, in continuation of this collection of services and full and verse anthems of old masters; and in 1790 a second and third volume, all dedicated to the king.

There is likewise, in the British Museum, Bibl. Harl. 7337, Plut. VI. B. a collection of English church music, in six vols. 4to. all transcribed for and dedicated to the right hon. Edward lord Harley, by Dr. Thomas Tudway, music professor of Cambridge. In these volumes, among some compositions of no great merit, there are many valuable productions by Tye, Tallis, Bird, Morley, Gibbons, Child, Blow, Purcell and Crofts, that have never yet been published.

SERVICE, Cathedral. See CATHEDRAL SERVICE.

SERVICE-Tree, in Botany, a corruption of the Latin *SORBUS*; see that article, as well as *PYRUS* and *MESPILUS*.

SERVICE-Tree, Wild. See *CRATÆGUS*.

SERVIENTES VIRGATORES. See *VIRGATOIRES*.

SERVIÈRE, in Geography, a town of France, in the department of the Lozere; 15 miles N.W. of Mende.

SERVIERES, a town of France, in the department of the Correze, and chief place of a canton, in the district of Tulle; 13 miles S.E. of Tulle. The place contains 1115, and the canton 8567 inhabitants, on a territory of 265 kilometres, in 10 communes.

SERVILE, in Hebrew Grammar, the denomination of a class of letters used in contradistinction to *radical*. The latter constitute *roots* (which see), and the former constitute derivatives, or branches from these roots, and are employed in all the different flexions. Of all the twenty-two letters of the alphabet, any of which may be radicals, there are properly only eleven letters that can claim this title, because they never can be serviles. The serviles are the other eleven letters, by means of which the whole business of flexion, derivation, numbers, genders, persons, and tenses, is accomplished. But even these letters are somewhat limited in their servile power. For only two of them, *viz.* ו and י can be inserted or ingrafted between radical letters; the others must be either prefixed or postfixed to the root. The eleven servile letters are the following; א, ב, ג, ד, ה, ו, ז, ח, ט, י, כ, ל, מ, נ, ש, פ, צ, ק, ר, שׁ, שׂ, ש׃.

SERVIN, LOUIS, in Biography, a celebrated lawyer in France, who flourished at the sixteenth and beginning of the seventeenth centuries, was descended of a good family in the Vendomois. He cultivated polite literature with success while he was young, and at an early period became the correspondent of several eminent men of letters in different parts of Europe. In 1589 he was appointed advocate-general to the parliament of Paris, being then, according to Vendome, "a young man of great learning, and much attached to the interests of his majesty Henry III." He distinguished himself in that station by his zealous support of the liberties of the Gallican church, and his opposition to the pretensions of the court of Rome. His printed pleadings were honoured with the censure of the Sorbonne, and with a virulent attack by a Jesuit of Provence. The title of his work was "Actions notables et Plaidoyers." In

1590 he published a work in favour of Henry IV., who had succeeded to the crown, entitled "*Vindiciæ secundum Libertatem Ecclesiæ Gallicanæ, et Defensio Regii Status Gallo-Francorum sub Henrico IV. Rege.*" In 1598, being joined in a commission for the reformation of the university of Paris, he delivered "a remonstrance" on the subject, which was printed. To him also is attributed a work in favour of the republic of Venice in the affairs of the Interdict. In the reign of Lewis XIII., at a bed of justice holden in 1620, he made strong and animated remonstrances in favour of the right of parliament to register royal edicts. On another similar occasion, for the purpose of compelling the registry of some financial edicts, as he was firmly but respectfully making fresh remonstrances to his majesty, he suddenly fell and expired at the king's feet, a memorable death, and such, says his biographer, as may in a measure entitle him to be enrolled among the martyrs to liberty. The private character of this excellent magistrate was worthy his high public reputation, and few men of his time stood in more general reputation.

SERVING, encircling a rope with line or spun-yarn, &c. to preserve it from the wet getting to it; also to prevent its being chafed. **RIGGING**, *Plate I. fig. 48.*

SERVING the Rigging. See **MALLET**.

SERVING-Mallet, a cylindrical piece of wood with a handle in the middle. It is used for serving rope, and has a groove along the surface, opposite to the handle, which fits the convexity of the rope to be served. **RIGGING**, *Plate I. fig. 49*, a short board with scores in it, is used for laying on small service.

SERVISTAN, in *Geography*, a town of Persia, in the province of Farsistan; 25 miles S.E. of Schiras.

SERVITES, an order of religious, so denominated from their vowing a peculiar attachment to the service of the Virgin.

The order was founded by seven Florentine merchants, who, about the year 1233, began to live in community on mount Senar, two leagues from Florence. In 1239, they received from the bishop the rule of St. Augustine, with a black habit, in lieu of a grey one, which they had worn before. In 1251, Bonifilio Monaldi, one of the seven, from being simple prior of mount Senar, was named general.

This order was approved of by the council of Lateran, and again by cardinal Raynerius, legate of pope Innocent IV., who put it under the protection of the holy see. The succeeding popes have granted it a great many favours. It is become famous in Italy, by the history of the council of Trent, of F. Paolo, a Venetian, who was a religious Servite. M. Hermant gives this order the name of the Annunciâté, doubtless from this mistake, that in some cities of Italy they are called *religious of the Annunciâté*, because in those cities their church is dedicated under that name. F. Archang. Giani derives the name Servites, servants of the holy Virgin, from hence; that when they appeared for the first time in the black habit given them by the bishop, the suckling children, as they say, cried out, *Behold the servants of the Virgin*. There are also nuns of this order.

SERVITIA, *Per Quæ*. See **PER QUÆ**.

SERVITIIS Acquietandis, a writ judicial that lies for a man distrained for services to one, when he owes and performs them to another, for the acquittal of such services.

SERVITIIS Consuetudinibus. See **CONSUETUDINIBUS**.

SERVITOR, in the university of Oxford, a scholar or student, who attends and waits on another for his maintenance there.

SERVITORS of Bills, denote such servants or messengers of the marshal of the king's bench, as were sent abroad with bills or writs, to summon men to that court. They are now commonly called *tip-slaves*.

SERVITUDE, the condition of a servant, or rather slave. Under the declension of the Roman empire, a new kind of servitude was introduced, different from that of the ancient Romans: it consisted in leaving the lands of subjugated nations to the first owners, upon condition of certain rents, and servile offices, to be paid in acknowledgment. Hence the names of *servi censiti*, *ascriptitii*, and *addicti glebæ*; some of which were taxable at the reasonable discretion of the lord; others at a certain rate agreed on; and others were mainmortal, who, having no legitimate children, could not make a will to above the value of five-pence, the lord being heir of all the rest; and others were prohibited marrying, or going to live out of the lordship. Most of which services still subsist in one province or other of France; though they are all abolished in England. Such, however, was the original of our tenures, &c. See **SLAVE**.

SERVIUS, MAURUS-HONORATUS, in *Biography*, a grammarian and critic, who flourished in the reigns of Arcadius and Honorius, is principally known by his Commentaries on Virgil, which, however, are considered rather as a collection of ancient remarks and criticisms on that poet than as made by himself. They contain many valuable notices of the geography and arts of antiquity. The Commentaries of Servius were first printed separately at Venice in 1471, and have frequently been reprinted since. In 1532 they were annexed to Stephens's Virgil, but they are most correctly given in Burman's edition in 1756. A tract on prosody by this author, entitled "*Centimetrum*," is printed in the collections of the ancient grammarians. Servius is mentioned with respect and honour by Macrobius, who makes him one of the speakers in his Saturnalia. *Gen. Biog.*

SERVIUS, SULPICIUS RUFUS, an eminent Roman jurist and statesman, was descended from the illustrious patrician family of Sulpicii. He was contemporary with Cicero, and born probably about a century before the birth of Christ. He cultivated polite literature from a very early period, especially philosophy and poetry, and wrote some pieces in the latter class, which were marked with the licentiousness of the time. He bore arms in the Marfic war; but finding himself better pleased with the arts of peace, he appeared a pleader at the bar in the 25th year of his age. The professions of advocate and lawyer were then so distinct, that the former were accustomed to consult jurists upon all difficult points. Servius having once applied for that purpose to Quintus Mucius, a very eminent lawyer, the latter perceiving that Servius did not comprehend his explanations, asked him if it were not a shame that he, a patrician and pleader, should be ignorant of the law upon which he was frequently called to speak. This reproof is said to have had such an effect upon him, that Servius quitted the bar, and gave all his attention to legal studies; and such was his success, that Cicero said of him, "If all, in every age, who in this city have acquired a knowledge of the law, were brought together, they would not be to be compared with Servius Sulpicius;" and he farther adds, that "he was not less the oracle of justice than of the law: he always referred to principles of equity and obvious interpretation what he deduced from the civil code, and was less desirous of finding grounds for actions than of settling disputes." There was a great intimacy formed between these two personages, and there are several letters extant from Cicero to Sulpitius, and two from Sulpitius to Cicero, of which

one is a well-known consolatory epistle on the death of Tullia.

Servius passed through the usual gradations of honour among Romans of rank. He was first *quæstor*, then *edile* and *prætor*. When the troubles of the republic were impending, he was created *interrex*, in which quality he nominated Pompey sole consul. He was himself consul with Marcellus, in the year 51 B. C., and opposed the motion of his colleague to remove Cæsar from his command, lest it should immediately bring on a civil war. After the battle of Pharsalia he declared for Cæsar, and was appointed governor of Achaia. When that chief was taken off he returned to Rome, and acted with the party who aimed at the restoration of public liberty. During the siege of Modena by Mark Antony, he was urged by the senate to undertake a legation to him, which, after pleading his age and infirmities, he accepted: but he foresaw it would be fatal to him, and he died in Antony's camp in the year 43 B. C. Cicero's ninth Philippic is entirely employed in pleading for a brass statue to the memory of this excellent man, as for one who had lost his life in the service of the republic, which was voted by the senate. Servius was author of a great number of volumes on legal topics, none of which have been preserved; but quotations from some of them are extant in A. Gellius.

SERVIVS TULLIVS, the sixth king of Rome, was the son of Ocrisia, a native of Corniculum, who was made a captive when the Romans took that place. Tarquin the Elder presented Ocrisia to his queen Tanaquil, and having a son born while she was in a state of servitude, he was named SERVIVS. It is not at all known who the father of this king was, and it was probably not till after his elevation to the regal dignity that he was represented as having been a person of rank who was killed in the defence of his country. Young Servius was brought up in the palace, and became a great favourite of the king and queen. He distinguished himself both in a civil and military capacity; was raised to the patrician order; had an important command in the army given him; and was at length united in marriage to Tarquinia, the king's daughter. On the assassination of Tarquin, Servius took possession of the throne, which event is dated in the year 577 B. C. As the sons of Ancus Martius, who were the authors of the conspiracy against Tarquin, had a strong party among the patricians, Servius pursued the policy of attaching the people to his interest, by paying off their debts, and making several regulations in their favour; and having added to his reputation by a defeat of the revolted Etruscans, he strengthened his title to the crown by procuring a legal election from the *curiæ*. He then applied himself to the improvement of the public police, and several of the most useful institutions of the Roman state took their origin in his reign. Servius enlarged the city by taking two more hills into its limits: he added a fourth tribe to the three old ones: he divided the whole Roman territory into tribes, with a *pagus*, or fortified post to each, and instituted a census, by which all the Roman citizens were distributed into six classes, according to their property. He also gave to the freedmen the privileges of citizens; and finding the duties of the regal office under the augmented population too numerous, he committed to the senate the determination of ordinary causes, reserving to himself only the cognizable crimes against the state. Aware that he was still looked upon by the nobles as an intruder on the throne, he endeavoured to add consequence to his family by marrying his two daughters to the grandson of the late king. He now created a closer connection between the Romans and their allies, the

Latins and Sabines, by the erection of a temple of Diana at Rome, at their common expence, in which they were to join in annual sacrifices, and in the amicable decision of all disputes among them. Servius, in many respects, was fortunate as a man and a monarch; but his greatest calamity was in his youngest daughter, who was continually urging her husband Arunx to criminal attempts against her father, but he nobly rejecting her infamous solicitations, she attached herself to the other brother, her sister's husband, Tarquin, a prince of a character and disposition very similar to her own. They got rid of their partners by poison, and then, having formed an incestuous union, they boldly and openly declared Servius an usurper, and Tarquin laid claim to the throne before the senate. The patricians generally came over to his interest; but the great mass of the people were determined to support their king, who, whatever might have been his descent, had shewn himself worthy of the crown which his infamous relations wished to tear from his head. Tarquin, however, continued to intrigue with his party, and at length took the daring step of assuming the royal robes and insignia, and seated himself on the throne at the temple in which the senate assembled. He there pronounced a violent invective against the person and government of Servius, who arrived while he was speaking, and approached to pull down his son-in-law from the throne; but Tarquin seized the venerable monarch by the waist, and threw him down the steps of the temple. He rose with difficulty, and was moving away by the help of some by-standers, when his unnatural daughter Tullia arrived, who, having saluted her husband as king, suggested to him the necessity of dispatching her own father. Tarquin sent persons to perpetrate the foul deed, and Tullia sealed her cruelty and impiety by driving her chariot over the dead body. Servius was murdered in his 74th year, after a reign of forty-four years, during which he had done enough to merit the title and character of one of the best kings of Rome.

SERULA, in *Ornithology*, the name of a web-footed sea-bird, a kind of *mergus*, very common about Venice, and called by Mr. Ray *mergus cirratus fuscus*, the brown-crested, or lesser-toothed diver, and supposed to be the *anas longirostra*, or long-beaked duck of Gesner. This is the red-breasted merganser of Pennant.

It is very nearly of the size of the duck; its head and throat are of a fine changeable black and green; on the first there is a long pendent crest of the same colour; the upper part of the neck and of the breast, and the whole belly, white; the lower part of the breast ferruginous, spotted with black; the upper part of the back black; near the setting on of the wings some white feathers, edged and tipped with black; the exterior scapular black; the interior white; lower part of the back, the coverts of the tail, and feathers on the sides, under the wings, and over the thighs, grey, marked with waving lines of black; covers on the ridges of the wings dusky, succeeded by a broad bar of white; the quill-feathers dusky, the tail is short and brown, and the legs orange-coloured; the head and upper part of the neck of the female are of a deep rust colour; the crest short, the throat white, and distinguished by some other varieties of colour from the male. These birds breed in the northern parts of Great Britain. Pennant.

SERUM. See BLOOD.

SERUM *Aluminosum*, *Alum-whey*, a form of medicine prescribed in the late London Pharmacopeia, made of a pint of milk boiled to whey with a quarter of an ounce of alum.

SERVONG, in *Geography*, a town on the N. coast of Sumatra. N. lat. 5° 3'. W. long. 96° 18'.

SERUSKUI,

SERUSKUI, a town of European Turkey, in Romania; 30 miles N. of Gallipoli.

SERWEEZ, a town of Russian Lithuania; 64 miles E. of Wilna.

SERWEL, a province of the Cuttore country.

SERWOY, in *Natural History*, a name given by Theodore de Bry, and others, to the animal called by us the *opossum*, and by the natives of Brasil the *carigüeya*.

SERYA, in *Geography*, a town of Hindoostan, in Oude; 32 miles S.W. of Lucknow.

SESA, a town of Nubia, on the Nile; 210 miles S.S.W. of Syene.

SESAMION, a word used by the ancients to express a preparation of the sesamum, or oily grain. It was a cake made of sesamum, honey, and oil.

SESAMOID, in *Anatomy*, a name given to some small bones of the thumb and great toe. See **EXTREMITIES**.

SESAMOIDES, in *Botany*, a name first published by Clusius, as applied at Salamanca to two very different plants, neither of them bearing any evident resemblance to *Sesamum*. These are *Silene Otites* and *Reseda Sesamoides*; see **RESEDA** and **SILENE**. Tournefort has founded on the last-mentioned species, along with *R. canescens* and *purpurascens*, his genus *Sesamoides*, *Inst.* 424. t. 238, whose character depends on the deep divisions of the ripe fruit, each of which embraces a seed, and seems a distinct capsule. But this is only one instance, amongst others, of the proteus-like nature of the very peculiar genus of *Reseda*.

SESAMUM, an ancient Latin name, *σισαμμον* in Greek, for which some vague derivations have been proposed, but which appears, as professor Martyn observes, to have been taken from *Sempsem*, the Egyptian name of the same plant, or grain, the use of which, as food, has been, from the most remote antiquity, common in the East. Those who have read the Arabian tales, will not forget the magic power of the word *Sesame*.—*Linn. Gen.* 323. *Schreb.* 422. *Willd. Sp. Pl.* v. 3. 358. *Mart. Mill. Dict.* v. 4. *Ait. Hort. Kew.* v. 4. 52. *Juss.* 138. *Lamarck Illustr.* t. 528. *Gærtn.* t. 110.—Class and order, *Didynamia Angiospermia*. *Nat. Ord.* *Luride*, *Linn.* *Bignonia*, *Juss.*

Gen. Ch. *Cal.* Perianth inferior, of one leaf, erect, short, permanent, in five deep, equal, lanceolate segments, of which the upper one is shortest. *Cor.* of one petal, bell-shaped; tube roundish, almost as long as the calyx; throat inflated, spreading, bell-shaped, very large, declining; limb in five segments, four of which are spreading, and nearly equal, the fifth, which is the lowermost, ovate, straight, twice as long as the rest. *Stam.* Filaments four, originating from the tube, shorter than the corolla, tapering, ascending, the two innermost shortest; anthers oblong, acute, erect; there is an imperfect filament besides. *Pist.* Germen superior, ovate, hairy; style thread-shaped, ascending, rather longer than the stamens; stigma lanceolate, deeply divided into two parallel plates. *Peric.* Capsule oblong, obscurely quadrangular, compressed, pointed, of two valves and four cells. *Seeds* numerous, nearly ovate.

Eff. Ch. Calyx in five deep segments. Corolla bell-shaped, five-cleft at the border; the lowest segment largest. A rudiment of a fifth filament. Stigma lanceolate, divided. Capsule of four cells.

Obs. Linnæus remarks that the flower agrees with *Digitalis*, but the fruit is widely different.

1. *S. orientale*. Common Sesamum or Oily-grain. *Linn. Sp. Pl.* 883. *Willd. n.* 1. *Ait. n.* 1. (*Sesamum* seu *Sempsem*; *Alpin. Egypt.* 98. t. 100. *S.* five *Sisamum*; *Ger. Em.* 1232.)—Leaves ovate-oblong, undivided; the lower ones somewhat serrated.—Native of the East Indies.

VOL. XXXII.

A tender annual, occasionally raised, for the sake of curiosity, in the stoves of Europe. The oil of its seeds is much used in Egypt and the East, being preferred to that of the olive. The seeds themselves are also a great article of food. An external application of the herb, either in the form of a fomentation or cataplasm, is supposed to be useful in cutaneous, and various other, disorders. The root is fibrous. Stem erect, near two feet high, branched, round, smooth, leafy. Leaves opposite, stalked, more or less ovate, one and a half to three inches long, finely downy; paler beneath; the upper ones entire; the lower often coarsely toothed, but not lobed or divided. Flowers axillary, stalked, white, about an inch long. Calyx and corolla hairy. Capsule erect, beaked, an inch long, transversely furrowed, rough with minute close-pressed hairs.

2. *S. luteum*. Yellow-flowered Sesamum. *Retz. Obs. fasc. 6.* 31. *Willd. n.* 2.—“Leaves lanceolate, on long stalks. Corolla externally hispid.”—Found by Koenig, in groves at Nidrapur, in the East Indies. The stem is upright, leafy, very little zig-zag. Leaves alternate, acute, rough at the edges, as well as the ribs beneath, with very short hairs. Flowers axillary, solitary, each on a short stalk, which proceeds from the base of the footstalk itself. Calyx and capsule hispid. Corolla deep yellow. *Retz.*

3. *S. indicum*. Indian Sesamum. *Linn. Sp. Pl.* 884. *Willd. n.* 3. *Rumph. Amboin.* v. 5. 204. t. 76. f. 1. (*S. alterum, foliis trifidis, orientale, femine obscuro*; *Pluk. Phyt.* t. 109. f. 4.)—Lower leaves ternate, or three-lobed, serrated; upper undivided. Stem erect.—Native of the East Indies, Mauritius, &c. Differs from the first species principally in the division of its lower leaves. The flowers are whitish, compared by Rumphius to those of *Henbane*. Both calyx and corolla are externally hairy, as in *S. orientale*. There is a variety with black, and another with brown or greyish, seeds. Both are used in Amboyna, but the latter is preferred.

4. *S. laciniatum*. Jagged Sesamum. *Willd. n.* 4.—“All the leaves deeply three-cleft, jagged. Stem prostrate, hispid.”—Gathered by Klein, in the East Indies, near Hyderabad.—The stem is branched, the extremities of its branches only ascending. Leaves opposite, on short stalks, rough on both sides; whitish beneath; their segments blunt, deeply toothed. Flowers axillary, solitary, on very short stalks. Capsule obtuse at each end, tipped with the broad permanent style. *Willdenow.*

Both this and the preceding may possibly be mere varieties of the first species. *S. luteum* appears to be distinct.

5. *S. prostratum*. Dwarf Hoary Sesamum. *Retz. Obs. fasc. 4.* 28. (*Euphrasie affinis pusilla planta, pericarpio lignoso oblongo quadrato bivalvi*; *Pluk. Amalth.* 85. t. 373. f. 2.)—Leaves roundish, toothed, hispid; hoary beneath. Stem prostrate, villous.—Native of loose sands near Madras; very rare elsewhere. *Koenig, Rotter.* Root woody, thick and strong, evidently perennial. Stems several, woody at the base, about a span long, much branched, leafy, villous, spreading flat on the ground in every direction. Leaves opposite, stalked, small, from one quarter to three quarters of an inch long, obtuse or abrupt, coarsely toothed, often wedge-shaped at the base; the upper surface hairy; lower white and cottony; the upper ones, beyond the flowers, often alternate. Flowers axillary, solitary, stalked, thrice as long as the leaves, very handsome. Corolla externally shaggy and hoary; internally yellow, beautifully stained and dotted with blood-red. Capsule ovate, quadrangular, hard, woody, hairy, scarcely more than

U u half

half the length of the corolla. *Seeds* numerous, oblong, angular, black.

Linnæus has erroneously referred the above synonym of Plukenet to his *Torenia asiatica*, a very different plant. Hence Willdenow was led to omit the present species of *Sesamum*, as very uncertain. *S. javanicum*, Burm. Ind. 133. Retz. Obf. falc. 4. 28, is *Columnnea longifolia*, Linn. Mant. 90. *Achimenes sesamoides*, Vahl. Symb. v. 2. 71. Willd. Sp. Pl. v. 3. 357.

SESAMUM is also a name given by some authors to the myagrum, or gold of pleasure.

SESBAN, a barbarous and inadmissible generic name, even when altered by Mr. Pursh into *Sesbania*, in his Flora of North America, v. 2. 460, 485. This name is given by Poiret in Lamarck's Dictionary, v. 7. 126, to a genus selected by him out of *ÆSCHYNOMENE*, see that article; and consisting of the Linnæan *Æ. grandiflora*, *coccinea*, and *Sesban*, with several others more recently discovered. These plants are mostly referred by Willdenow to *Coronilla*, with which they do not ill accord. They certainly cannot remain with the original species of *Æschynomene*, which scarcely differ from SMITHIA, see that article.

SESEL, Poiret in Lam. Dict. v. 7. 130, the Amboyna name of a tree, which, according to Rumphius, assumes a very different appearance on the coast to what is usual in the adjacent plains; the *leaves*, always strongly three-ribbed and entire, lanceolate in the latter situation, being roundish-ovate, and much shortened, in the former. He speaks of this plant as allied to *Metrofideros*, the wood being so hard as to spoil the tools used in cutting it down: Nothing is known of the fructification, except that the *flowers* form small whitish heads, subsequently brown, and the *fruit* seems a globose yellow berry, or drupa. See Rumph. Amboin. v. 3. 64. t. 36, 37.

SESELI, an old Latin name for some plants of the umbelliferous family, which may possibly be included in the present genus. It is *σεσέλις* also in Greek; but no person has been able to give a plausible Greek etymology of the word, which Ray judges to be barbarous, like some other names ending in *i*. De Theis accordingly, on the authority of James Golius, deduces it from an Arabic word which he writes *Seycellyous*.—Linn. Gen. 143. Schreb. 193. Willd. Sp. Pl. v. 1. 1458. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 2. 154. Sm. Prodr. Fl. Græc. Sibth. v. 1. 199. Pursh v. 1. 197. Juss. 220. Lamarck Illustr. t. 202.—Class and order, *Pentandria Digynia*. Nat. Ord. *Umbellifera*.

Gen. Ch. *General Umbel* rigid; *partial* very short, of many rays, globose. *General Involucrum* of very few leaves, or none; *partial* of several pointed leaves, about the length of the partial umbel. *Perianth* scarcely discernible. *Cor.* *Universal* uniform; *florets* all fertile; *partial* nearly flat, of five petals, whose inflexed points render them heart-shaped. *Stam.* Filaments five, awl-shaped; anthers simple. *Pist.* Germen inferior; styles two, distant; stigmas obtuse. *Peric.* Fruit ovate, small, striated, separable into two parts. *Seeds* two, ovate, convex and striated at the outer side, flat on the inner.

Eff. Ch. Umbels globose, rather rigid. Flowers regular, all fertile. General involucrum of one or two leaves; partial of several. Fruit ovate, striated.

Obf. *S. Hippomarathrum* offers a remarkable exception to the above generic character, having a partial involucrum of one leaf, orbicular and toothed, like the wheel of a clock. That of *S. gummiiferum* is nearly similar.

1. *S. filifolium*. Thread-leaved Meadow-saxifrage. Thunb. Prodr. 51. Willd. n. 1.—Leaves linear-thread-

shaped. Stem zigzag, erect. Perianth awl-shaped.—Gathered at the Cape of Good Hope, from which we have an authentic specimen. The *stem* is a foot high, slightly branched, round, furrowed, smooth. *Leaves* two or three, one of which only remains perfect, an inch long, undivided, very narrow, acute, ribbed, smooth, somewhat channelled. *Umbel* terminal, of four rigid striated rays, with a *general involucrum* of as many unequal, lanceolate, ribbed, smooth *leaves*, the longest but half the length of the rays. *Partial umbels* level-topped rather than globose, of ten or more short stout angular rays, and several lanceolate *partial involucral* leaves, of the same length. The half-ripe *fruit* is oblong, about as long as the stalks which support it, furrowed, crowned with a very evident *calyx*, of five awl-shaped, sharp, permanent, somewhat spinous, teeth, finally recurved at the points. We have been the more particular in our description, as there is no figure of this plant extant, and few botanists would recognize it for a *Seseli*.

2. *S. pimpinelloides*. Nodding Meadow-saxifrage. Linn. Sp. Pl. 372. Willd. n. 2.—Stem declining, and umbels drooping, before flowering. Leaves pinnate; leaflets doubly pinnatifid, with alternate, flat, linear, decurrent segments.—Native of the south of Europe. Cultivated by Linnæus at Upsal. Perennial. *Stem* a foot high, slightly leafy, round, finely striated, smooth, decumbent at first, but firmly erect as the *flowers* come to perfection, and bearing about three rather large *umbels*, which in a young state droop, like those of *Pimpinella Saxifraga*. Radical *leaves* stalked, a span long, smooth, of a light glaucous green; their segments spreading, acute, entire, veiny, very uniform. *Flowers* white. *Partial involucrum* of one or two, almost capillary, leaves. *Seeds* a quarter of an inch long, nearly oval, with five elevated ribs, three of which are central, two marginal, and dark intermediate furrows.

3. *S. montanum*. Mountain Meadow-saxifrage. Linn. Sp. Pl. 372. Willd. n. 3. Ait. n. 1. (*S. multicaule*; Jacq. Hort. Vind. v. 2. 59. t. 129. *Carvisolia*; Vaill. Paris. t. 5. f. 2.)—Footstalks under the branches oblong, entire, with a membranous edge. Stem-leaves with linear very narrow segments. Seeds downy.—Native of hillocks in Italy and France. Cultivated at Oxford in the middle of the 17th century. A hardy plant, flowering in summer. *Root* perennial, tapering, crowned with the fibres of decayed footstalks. *Stems* erect, from one to three feet high, round, striated, smooth, branched, leafy. *Leaves* doubly pinnate, three-cleft; the segments of the upper ones longest, narrowest, and most glaucous; their *footstalks* sheathing, close, striated, with more or less of a membranous border, entire at the summit. *Umbels* smaller than in the preceding, erect, white, of many rays, sometimes accompanied by a general involucral leaf. *Seeds* obovate, one-fourth the length of the former, ribbed, minutely downy.

4. *S. striatum*. Furrowed Meadow-saxifrage. Thunb. Prodr. 51. Willd. n. 4.—Footstalks under the branches with a membranous edge, emarginate. Stem striated. Leaflets awl-shaped, channelled.—Native of the Cape of Good Hope. Thunberg.

5. *S. glaucum*. Glaucous Meadow-saxifrage. Linn. Sp. Pl. 372. Willd. n. 5. Ait. n. 2. Jacq. Austr. t. 144.—Footstalks under the branches oblong, entire, with a membranous edge. Branches spreading. Leaflets linear, channelled, smooth, glaucous, longer than their footstalks. Seeds ovate, downy. Umbels lax.—Native of France. To define the difference between this plant and *S. montanum* is very difficult. The *glaucum* has longer leaflets, and the primary divisions of its radical leaves seem to be always stalked, not sitting close to the mid-rib. The *branches* are more divaricated,

eated, and umbels more lax. *Seeds* rather shorter. In Jacquin's figures these plants appear very different, but the *glaucom* of most authors is merely *montanum*. Jacquin does not notice the hairy *seeds*.

6. *S. arifolium*. Bearded-leaved Meadow-saxifrage. Ait. n. 3. Willd. n. 6. (*Ligusticum lucidum*; Mill. Dict. ed. 8. n. 4.)—"Footstalks under the branches lax, entire, somewhat membranous. Leaves repeatedly compound; leaflets lanceolate, brittle-pointed. Fruit ovate."—Native of the Pyrenean mountains. Cultivated by Miller at Chelsea. A hardy perennial, flowering in June and July. *Aiton*. Miller says the *root* is biennial. *Leaves* doubly pinnate; lobes very narrow, and finely divided. *Stems* strong, a foot and half high, furnished with shining winged leaves, and terminated by pretty large umbels of whitish flowers. A specimen sent by Gouan for *S. annuum*, which it certainly is not, seems to be the plant under consideration. The segments of its *leaves* have callous tips. The leaves of the partial *involucrum* are ovate, with broad white membranous edges, their points extending beyond the *flowers*.

7. *S. annuum*. Caraway-leaved Meadow-saxifrage. Linn. Sp. Pl. 373. Willd. n. 7. Jacq. Austr. t. 55. (*S. carvifolium*; Villars Dauph. v. 2. 586, from the author. *S. coloratum*; Ehrh. Herb. n. 113. Beitr. v. 5. 179. *Pimpinella tenuifolia*; Rivin. Pentap. Irr. t. 83. f. 1. *Fœniculum sylvestre annuum*, tragofolini odore, umbellâ albâ; Vaill. Paris. 54. t. 9. f. 4.)—Footstalks of the upper leaves lax, membranous, emarginate. Stem and branches erect. Leaves doubly pinnate, cut; their primary divisions sessile. *Seeds* smooth.—Native of France, Germany, and Switzerland. *Root* tapering, woody, crowned with fibres of decayed leaves, and having all the appearance of being perennial. *Stem* twelve or eighteen inches high, erect, stiff, somewhat zigzag, round, striated, leafy, often purplish; its branches very little spreading. *Leaves* stalked, varying greatly in the length of the leaflets and their divisions, green rather than glaucous; occasionally purplish; their segments linear-oblong, narrow, keeled. *Umbels* white or purplish, of many general as well as partial rays, all more or less downy. Partial *involucrum* of many lanceolate membranous-edged leaves, whose taper points reach beyond the flowers. *Seeds* elliptic-oblong, very convex, with three dorsal ribs, destitute of pubescence in every part. We have this species from M. Du Cros as Haller's n. 762, to which it seems well enough to answer, but if so, Gouan mistakes Haller's plant.

8. *S. charophylloides*. Chervil Meadow-saxifrage. Thunb. Prodr. 51. Willd. n. 8.—"Footstalks under the branches membranous, tumid, entire. Stem forked, panicled. Leaves repeatedly compound, smooth."—Gathered by Thunberg, at the Cape of Good Hope.

9. *S. Ammoides*. Milfoil Meadow-saxifrage. Linn. Sp. Pl. 373. Willd. n. 9. Ait. n. 4. Jacq. Hort. Vind. v. 1. 20. t. 52. (*Ammoides*; Bauh. Pin. 159. *Ammi*; Matth. Valgr. v. 2. 120. A. Matthioli; Dalech. Hist. 695.)—Leaflets of the radical leaves imbricated; those of the upper ones almost capillary. Stem spreading. Rays of the umbel capillary, very unequal. *Seeds* smooth.—Native of Greece, Portugal, Italy, Sicily, and the south of France. A slender annual plant, about a foot high, its *stem* generally branched from the very bottom. Lower *leaves* on long slender stalks, pinnate, their leaflets in many narrow-lanceolate, channelled segments, lying over each other; upper usually twice ternate, with much longer, and very slender, undivided leaflets; their footstalks short, sheathing, furrowed, and membranous. *Umbels* terminal, very delicate and lax, of about seven or eight extremely unequal capillary rays; the partial ones of more numerous, but like-

wife unequal, much shorter, spreading rays. *Involucral leaves* bristle-shaped. *Flowers* white. *Fruit* minute, roundish-ovate, striated, smooth.

10. *S. tortuosum*. Crooked Meadow-saxifrage. Linn. Sp. Pl. 373. Willd. n. 10. Ait. n. 5. (*S. massiliense*, fœniculi folio, quod Diofcoridis censetur; Bauh. Pin. 161. *Fœniculum tortuosum*; Bauh. Hist. v. 3. p. 2. 16.)—Stem much branched, divaricated, rigid, furrowed and angular. Leaves of the partial *involucrum* ovate, membranous at the edges, somewhat combined at the base.—Native of the south of Europe. *Root* biennial, rather than perennial. This species is known by its remarkably rigid, repeatedly branched, straggling *stem*, bearing great numbers of rigid, clumsy, spreading *umbels*; each frequently accompanied by a general *involucrum* of one leaf. The *stem-leaves* are commonly very small, with a large, broad, abrupt, membranous-edged *footstalk*. Whether the leaflets of the *radical leaves* vary greatly in length and breadth, or whether Linnæus has, under this, confounded several distinct species, we have not sufficient information to decide. The whole herbage is glaucous, of a thick rigid habit.

11. *S. gummiferum*. Gummy Meadow-saxifrage. Sm. Exot. Bot. v. 2. 121. t. 120. Ait. Epit. 374.—Stem furrowed, rigid, leafy. Partial *involucrum* of many linear leaves, united by a broad base. Flowers almost sessile. Leaflets wedge-shaped.—Gathered by professor Pallas in the Crimea. It was observed by Mr. Lambert in the Oxford garden, about the year 1803, and communicated by him to his friends. The plant is biennial, hardy, flowering in summer and autumn. *Stem* three or four feet high, erect, branched, leafy, very stout and rigid, furrowed, minutely downy; when wounded exuding a copious, yellow, fetid resinous gum. *Leaves* a span long or more, triply pinnate, glaucous, somewhat downy; their leaflets oblong or wedge-shaped, flat, decurrent, acute. *Umbels* terminal, erect, finely downy, flattish, from three to six inches broad, of very numerous rays. *General involucrum* usually of one short strap-shaped leaf; but in the large primary umbel of several: *partial* with a broad, simple, disk-like base, fringed with copious, horizontal, linear, acute leaflets, nearly equal to the *flowers*. Each partial *umbel* is flat when young, partially coloured with purple and white, but afterwards convex, consisting of innumerable almost sessile *flowers*, powdered over, as it were, with the white *anthers*. *Petals* red and white, inflexed, nearly regular. *Germen* furrowed, smooth. *Fruit* elliptical. The *flowers* have a faint smell, not unlike those of the Barberry. In Haller's letters, v. 2. 318, is one from Dillenius, dated Dec. 1746, in which he speaks of an umbelliferous plant, sent under the name of *Seseli* from Siberia, which, being sown in the spring, flowered, but perished on the approach of winter, without producing seed. He conceived it to be allied to the *Hippomarathrum* of Rivinus, (see our next species,) on account of the simple-leaved partial *involucrum*, cut into six or eight teeth. The general umbel had a slender strap-like leaf to each ray. The seeds resembled those of Caraway, and were not winged. Might not this be our *S. gummiferum*? If so, Dillenius ought to be recorded as its original introducer.

12. *S. Hippomarathrum*. Cupped Meadow-saxifrage. Linn. Sp. Pl. 374. Willd. n. 12. Ait. n. 6. Jacq. Austr. t. 143. (*Hippomarathrum*; Rivin. Pentap. Irr. t. 67. *Saxifraga pannonica*; Clus. Hist. v. 2. 196. Ger. Em. 1047.)—Stem nearly leafless. Partial *involucrum* of one cup-shaped many-toothed leaf.—Native of stony ground in Austria, Carniola, Hungary, &c. flowering in July and August. The *root* is woody and perennial, crowned with the scaly or fibrous remains of old footstalks. *Stems* a foot

high, nearly upright, rigid, round, smooth, rusty, somewhat branched above, bearing several oblong, sheathing, membranous-edged *footsalks*, with only very short or abortive *leaves*. The proper *leaves* are radical, pretty numerous, stalked, two or three inches long, doubly pinnate and cut, linear, glaucous and smooth like the rest of the herbage. *Umbels* terminal, solitary, small and close, rigid, minutely downy, with several principal rays, and sometimes a sheath-like leaf at the base; the *partial* ones of many white, nearly sessile, *flowers*, chiefly remarkable for the simple, cup-like, partial *involucrum*, whose membranous downy edge is variously jagged and toothed. Dillenius rightly observes, in the letter to Haller, quoted under our last species, that this singular part is not shewn in the figure of Clusius and Gerarde. It indicates an affinity to our *gummiferum*, which obliges us to place these two species together, next to *tortuosum*, with which they accord greatly as to habit.

13. *S. Turbith*. Turbith Meadow-faxifrage. Linn. Sp. Pl. 374. Amoen. Acad. v. 4. 310. Willd. n. 11. (*S. quæ ferulæ facie*, Thapsia, five Turbith, gallorum; Bauh. Hist. v. 3. p. 2. 45. Boerh. Lugd. Bat. v. 1. 50. Thapsia Dioic; Lob. Ic. 779. *T. tenuifolia*; Ger. Em. 1030.)—Leaves repeatedly three-cleft, divaricated, awl-shaped. General *involucrum* of one or two awl-shaped leaves; partial of many short, pointed, membranous ones. Seeds villous, the length of the permanent styles.—Native of Spain, and the south of France. The *root* is perennial, thick, discharging a milky juice, which, according to John Bauhin, to whom it was pointed out by his preceptor Rondelet, possesses a valuable purgative quality. *Stem* erect, branched, round, smooth, not so clumsy as in Bauhin's figure. *Leaves* chiefly opposite, with broad sheathing *footsalks*, spreading, repeatedly subdivided into divaricated, slender, awl-shaped segments, crossing each other, and much resembling fennel. *Umbels* terminal, large, of many slender, downy, spreading, general as well as partial, rays. General *involucrum* of very few and short, tapering, scarcely membranous-edged leaves; those of the *partial* ones more membranous, lanceolate, fringed, half the length of the flower-stalks, quite distinct at their base. *Petals* white. *Fruit* ovate, covered with fine hoary dense bristly hairs, and crowned with the long spreading *styles*, very tumid at their base. *Stigmas* obtuse, but hardly capitate.

14. *S. pyrenaum*. Pyrenean Meadow-faxifrage. Linn. Sp. Pl. 374. Willd. n. 13. Ait. n. 7. (*Selinum pyrenaum*; Gouan Illustr. 11. t. 5. Carvi alpinum; Bauh. Prodr. 84. Lachenal Aët. Helvet. v. 7. 332. t. 12.)—Leaves doubly pinnate, with many linear, acute, decurrent, flat segments. Partial *involucrum* setaceous, equal to the flowers. Seeds smooth, nearly orbicular, with three close central ribs.—Native of the Pyrenées. Miller appears to have cultivated it in 1731. The *root* is perennial, the size of the finger. *Stem* a foot high, erect, furrowed, smooth, scarcely branched, most leafy at the lower part. *Foosalks* long, dilated and sheathing at the base. *Leaves* three or four inches in length, light green, smooth, their leaflets uniform, with linear, alternate, pointed, decurrent, veiny segments. *Umbels* of six or eight unequal rays, without any general *involucrum*; the *partial* ones convex, dense, many-flowered, with a *partial involucrum* of many smooth, slender leaves, almost capillary, distinct at the bottom. *Petals* yellowish, with a purple tinge externally. *Seeds* with a broad, flat, even margin, their centre marked with three close prominent ribs.

15. *S. faxifragum*. Slender Meadow-faxifrage. Linn. Sp. Pl. 374. Willd. n. 14. (*Pimpinella faxifragia tenuifolia*; Bauh. Prodr. 84.)—"Stem thread-shaped, divari-

cated. Leaves doubly ternate, linear. Umbels of about six rays."—Plentiful about the lake of Geneva, according to C. Bauhin, who describes it with an oblong *root*. *Stem* a foot high, green, smooth, striated, bent, divided from the base, and subdivided into slender *branches*. *Leaves* in slender, afterwards almost capillary, segments. *Flowers* few, minute, whitish, in a small umbel. It is not possible to determine any thing from this description, nor have we seen an authentic specimen. Linnæus saw this species in Burfer's herbarium only. His account agrees with the above, only adding that the partial *involucral* leaves are bristle-shaped.

16. *S. elatum*. Tall Meadow-faxifrage. Linn. Sp. Pl. 375. Mant. 357. Willd. n. 15. Ait. n. 8. Gouan Illustr. 16. t. 8.—Stem much branched, round, rigid, very smooth. Leaves twice ternate, with linear, fleshy, distant leaflets. Fruit smooth, ovate, with distant obtuse ribs. Partial *involucrum* awl-shaped, shorter than the flowers.—Native of Italy and the south of France. Specimens are in the Linnæan collection from Arduins and Gouan, as well as the garden plant alluded to in the letter of Linnæus, cited by Gouan. These, as well as Gouan's figure, prove the present species to vary greatly in luxuriance. The *stem* is from eighteen inches to five feet high, much branched from top to bottom, very smooth, pale at the joints, leafy, the upper part greatly divaricated. *Lower leaves* twice ternate; *upper* quite simple; all linear, very narrow, fleshy, smooth; each leaf, or leaflet, from one to two inches long. *Foosalks* linear, channelled, sheathing, close, with an evident, though narrow, membranous edge. *Umbels* numerous, terminal, of from two or three to ten rays, smooth, without an *involucrum*; *partial* ones of many shortish unequal rays, their *involucral leaves* slender, but membranous, rarely equal to the flowers. *Petals* white. *Seeds* ovate, gibbous, smooth, by no means tuberculated, though Gouan describes them dotted; each is marked with three slightly prominent ribs, but not bordered. The synonym of Magnol, quoted in Sp. Pl. was afterwards referred by Linnæus to his *Pimpinella glauca*.

17. *S. triternatum*. Yellow Meadow-faxifrage. Pursh v. 1. 197.—"Leaves triply ternate; leaflets linear, elongated. Umbels hemispherical. Partial *involucrum* of many linear leaves, as long as the flowers."—About the waters of Columbia river, where it was found by governor Lewis, flowering in April and May. The spindle-shaped perennial *root* is one of the grateful vegetables of the Indians, who use it baked or roasted. *Flowers* deep yellow. *Pursh*.

18. *S. junceum*. Rusty Meadow-faxifrage. Sm. Prodr. Fl. Græc. Sibth. n. 698.—Stem much branched, divaricated. *Foosalks* of the stem-leaves very short, and spreading. Umbels solitary, simple, of few flowers.—Found in the Greek herbarium collected by Dr. Sibthorp, but without any name, or mention of the place where it was gathered. The *root* appears to be perennial. *Herb* a span high, rigid, smooth, rather glaucous. *Radical leaves* twice ternate, with keeled three-pointed leaflets; those of the stem very small, and as if abortive. *Umbels* small, white.

19. *S. caespitosum*. Tufted Meadow-faxifrage. Sm. Prodr. Fl. Græc. Sibth. n. 699.—Stem simple, nearly naked. *Radical leaves* tufted, flat, pinnate, cut; the terminal leaflet three-cleft, decurrent.—Gathered by Dr. Sibthorp, and his companion Borone, on the summit of the Bithynian Olympus. The *root* is thick, perennial, dividing at the crown into many heads. *Stems* from four to eight inches high, simple, scarcely ever divided, erect, straight, stiff and smooth, bearing a solitary leaf only. *Radical leaves* forming a dense tuft, smooth, rigid, of various sizes. The *foosalk* of the stem-leaf has a membranous edge. General umbel of

of about five rays. *Fruit* cylindrical, obscurely striated, smooth.

SESELI-Seed, in the *Materia Medica*, the name of the seed of a plant, called also by some libanotis, and growing three or four feet high, with leaves like fennel, but of a paler green. It is a native of warm climates. The seed ought to be chosen moderately large, of a longish shape, heavy, clean, and of a greenish colour, fresh, and of a grateful smell. It affords, by distillation, a very large quantity of an essential oil, and is hot and dry. It incises, opens, and discusses, and is cephalic, neurotic, pectoral, and nephritic. It is good against epilepsies, apoplexies, vertigos, and all disorders of the head and nerves. Lemery's Dict. of Drugs.

The seeds of the *seseli Creticum*, or hart-wort of Crete, are diuretic, uterine, and good in all disorders of the breast and lungs. They are given in suppressions of urine, and of the menses, and in all kinds of flatulencies; and are, among the German physicians, a common ingredient in medicines, intended to promote expectoration.

The seed of the French hart-wort, or *seseli Maffiliense*, has been esteemed of great virtue in diseases of the head and nerves, in convulsions and epilepsies, and in weakness of the sight. It is also given in electuaries, intended against all disorders of the breast and lungs, in coughs, catarrhs, and asthma, and in obstructions of the liver. Some have recommended it singly, as a medicine of great efficacy against obstructions of the menses; and Schroder tells us, that it has the credit of being an antidote to the poison of hemlock.

The common hart-wort is possessed of the same sort of virtues with the other two, but its seed is more warm and acrid than that of either of them. It is esteemed a very efficacious remedy in obstructions of the menses, and in all disorders arising from indigestion, crudities, and flatulencies. See SERMOUNTAIN.

SESELI Pratense. See SAXIFRAGE.

SESEME-QUIAN, in *Geography*, a river of the N.W. territory, in the United States of America, which runs into the Illinois.

SESEN, or **SESEM**, a town of the principality of Wolfenbüttele; 12 miles S.W. of Goslar.

SESERINUS, in *Ichthyology*, a name given by Rondeletius, and some other authors, to a broad and short sea-fish, seeming the same with the lampuga of Italian fishermen; and described by authors in general, and by this very author in another place, under the name of *Stromateus*.

SESHA, in *Hindoo Mythology*. Images of Naga, or Seshha, in brass, are said to be invoked in cases of ill-health, with appropriate ceremonies, and according to the author of the Hindoo Pantheon, they are very common in India, where the idea of the medicinal virtues of snakes appears to be of very old date. A Hindoo, attacked by a fever, or other disease, makes an image of Naga in brass, clay, or wax, and performs appropriate ceremonies in furtherance of his recovery. Such ceremonies are particularly efficacious when the moon is in the nakshatra, or asterism, called Sarpa, or the serpent. We have observed that the snake, in all mythological language, is an emblem of immortality; its endless figure, when its tail is inserted in its mouth, an astrological mysticism common to Asia and Europe; and the annual renewal of its skin and vigour afford symbols of continued youth, of duration, and eternity; and its supposed medicinal virtues, or life-preserving qualities, may also have contributed to the fabled honours of the serpent tribe. In the mythological machinery of India, Egypt, and Greece, these coincidences are numerous. Some learned writers attribute this universality of serpent-forms to

the early and all-pervading prevalence of sin, its first shape on earth. For some notice of fabulous relations connected herewith, see KUSA and SUPERNA. With the Hindoos, serpents are not always of ill omen. A day in the Indian kalendar, called "nagapanchami, is sacred to the demi-gods in the form of serpents, who are enumerated in the Padma and Garuda Puranas." Cities, towns, mountains, rivers, men, women, &c. are commonly, among the Hindoos, named after mythological personages. Nagpour, the capital of the rajah of Berar, properly Nagapuri, is after one of the common names of Seshha, as is also a town in Mysore, Naugmungalum, properly Naga-mangala. See MAN-GALA.

One of the fables most commonly alluded to in Hindoo writings, is Vishnu reposing on Seshha, and it is a favourite subject with painters. In a beautiful ode, by sir W. Jones, addressed to Lakshmi, the Magna mater of her sectaries, (see LAKSHMI,) her union with Vishnu is introduced. On this occasion the bride rose from the churned sea, like our Venus, and choosing Vishnu for her husband, the subject of this article formed a nuptial couch for her reception: thus poetically described.

" ——— Love bade the bridegroom rise:—

Straight o'er the deep, then dimpling smooth, he rush'd,
And tow'r'd th'unmeasur'd snake — stupendous bed!—

The world's great mother, not reluctant, led:

All nature glow'd where'er she smiled or blush'd:

The king of serpents hush'd

His thousand heads, where diamond mirrors blaz'd,

That multiplied her image as he gaz'd."

The operation of churning the ocean, alluded to above, is described under the article KURMAVATARA of this work, and a poetical allusion to the reflecting gems or mirrors on the heads of Seshha, will be found under SHITAKOONTHA. See also LOTOS.

SESHNAGA, a name of a mighty mythological serpent among the Hindoos, otherwise called *Seshha*; which see.

SESHTI-MATRIYA, a name of Kartikya, the mythological commander of the celestial armies of Hindoo fable. The name means having *six mothers*. Shan-matriya has the same meaning, and is another of his names, and Shanmatura. Shanmuka is another, and means with six faces or mouths. For the origin of these appellations, and for some particulars of the hero so distinguished, see KARTIKYA, and SKANDA, another of his names.

SESIA, in *Geography*, a river of Italy, which rises in the Alps, on the borders of the Valais, and runs into the Po, a little below Casal.

SESIA, one of the six departments of France, into which Piedmont was divided, when it was united to the French republic. Aug. 26, 1802; it is composed of Verceil and Mafserans, in N. lat. 45° 25', E. of Doire; and contains 140 square leagues, and 204,445 inhabitants; it was divided into three circles, viz. Verceil, comprehending 79,391 inhabitants; Santhia, with 36,014; and Bielle, having 89,040 inhabitants. The climate of this department is unhealthy; the eminences and hills are favourable for the culture of the vine; and the cultivated plains yield abundance of grains, fruits, and pastures.

SESIAL, a town on the N.W. coast of Timor. S. lat. 8° 54'. E. long. 125° 26'.

SESKAR, a small island in the N. part of the gulf of Bothnia. N. lat. 65° 38'. E. long. 23° 39'.—Also, a small island in the gulf of Finland. N. lat. 59° 57'. E. long. 28° 14'.

SESLERIA,

SESLERIA, in *Botany*, received that appellation from Scopeli, who in the first edition of his excellent *Flora Carniolica*, says, he could never forget the delightful garden, so rich in scarce plants, which he often used to visit, while at Venice, in the year 1745. It was formed in the island of St. Helen, by Dr. Leonard Sessler, whose great diligence in observing and cultivating plants justly entitled him, in Scopeli's opinion, to this botanical commemoration. A letter of his, describing a supposed new genus, under the name of *Vitaliana*, is subjoined to Donati's *Storia Naturale del Adriatico*, but Linnæus reduced the plant to *Primula*.—Scop. Carn. ed. 1. 189. Sm. Fl. Brit. 93. Prodr. Fl. Græc. Sibth. v. 1. 52. Ait. Hort. Kew. v. 1. 153. Juss. 31. Lamarck Dict. v. 7. 138. Illustr. t. 47.—Class and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Gen. Ch. Cal. Glume of two, nearly equal, ovato-lanceolate, concave, pointed valves, containing about three flowers. Cor. of two unequal, erect, parallel, acute, valves; the inner folded, two-ribbed, cloven; outer rather the longest, entire or three-cleft. Stam. Filaments three, capillary, longer than the flower; anthers pendulous, oblong, cloven at each end. Pist. Germen superior, ovate; styles two, various in length, capillary, more or less combined; stigmas oblong, cylindrical, feathery. Peric. none, except the corolla, which embraces the seed, but is not attached to it. Seed solitary, ovate, smooth.

Eff. Ch. Calyx of two valves, containing about three florets. Corolla of two valves; the inner cloven; the outer variously pointed. Styles united at their base.

1. *S. cerulea*. Blue Moor-grass. Scop. Carn. ed. 2. v. 1. 63. Fl. Brit. n. 1. Engl. Bot. t. 1613. Knapp Gram. t. 43. Ait. n. 1. Arduin. Spec. 2. 18. t. 6. f. 3—5. Poiret in Lam. Dict. n. 1. Host Gram. Austr. v. 2. 69. t. 98. (*Cynofurus cæruleus*; Linn. Sp. Pl. 106. Willd. Sp. Pl. v. 1. 414. Ehrh. Calam. 14. Mart. Ruft. t. 20. Jacq. Ic. Rar. v. 1. t. 21. Gramen glumis variis; Bauh. Pin. 10. Prodr. 21. Theatr. 158. Scheuchz. Agr. 83. t. 11. f. 9. A, B.)—Spike ovate-oblong, imbricated. Bractæas alternate. Outer petals with three teeth.—Native of mountainous pastures, or calcareous rocks, in various parts of Europe, flowering in the early part of summer. It occurs in Westmoreland and Scotland, but not frequently. The root is perennial, tufted, deeply descending, with long firm fibres. Stems a span or more in height, simple, round, without joints, smooth, naked, except at the base. Leaves linear, obtuse, recurved, broadish, keeled, rough-edged; each with a short, tubular, compressed sheath, and a very minute stipula. Spike terminal, solitary, erect, an inch or inch and half long, of a shining purplish-grey, with solitary, jagged, membranous bractæas, of the same colour, at the base of some of the lowermost spikelets. The spikelets are rather numerous, usually turned one way, and mostly in pairs, each of two or three flowers. Calyx with short awns. Petals ribbed; the outer with three teeth, the middle tooth slightly awned; inner petal with two equal teeth; all the ribs fringed. Styles joined at the lower part only.

2. *S. alba*. White Moor-grass. Sm. Fl. Græc. Sibth. v. 1. 56. t. 72. v. 2. 2. (*Carex dubia*; Sibth. MSS.)—Spike ovate-oblong, imbricated. Bractæas alternate. Outer petals lanceolate, acute, undivided.—Discovered by Dr. Sibthorp, in woods about the village of Belgrad, near Constantinople. The general aspect of this grass, so like some of our common species of *Carex*, with compound androgynous spikes, easily led its learned discoverer to refer it to that genus. He was, at the same time, too accurate to overlook the differences of its generic character; though not sufficiently acquainted with *Sesleria*, to perceive its agreement

herewith. This species is somewhat larger in every part than the foregoing, and has a creeping root, sheathed with the wrinkled bases of old leaves. The stems are twelve or eighteen inches high, and the foliage nearly as tall. Spike of a greenish-white, rather shining, scarcely branched. Spikelets two or three together, stalked. Calyx three or four-flowered, membranous, taper-pointed; the middle florets stalked. Petals membranous, whitish, with green roughish keels; the outer one lanceolate, pointed, undivided; inner cloven a little way down into two sharp-pointed lobes, each of which has its own folded rib or keel. Stamens white, considerably longer than the flowers; anthers pale yellow, drooping. Styles smooth, united throughout, the length of the corolla; stigmas divaricated, awl-shaped, clothed with short pubescence. This *Sesleria* serves greatly to confirm the genus, and to indicate its true essential character.

3. *S. sphaerocephala*. Round-headed Moor-grass. Arduin. Spec. 2. 20. t. 7. Poiret in Lam. Dict. n. 2. Lamarck Illustr. t. 47. f. 2. (*Cynofurus sphaerocephalus*; Jacq. Misc. v. 2. 71. Ic. Rar. t. 20. Willd. Sp. Pl. v. 1. 414. *C. microcephalus*; Hoffm. Germ. 49.)—Spike capitate, globose, bracteated at the base. Outer petals with three teeth; the middle tooth awned.—Native of the loftiest alps of Carinthia, Austria, the Tyrol, &c. A very much more slender plant than either of the former. The root is fibrous. Stem four or five inches high, somewhat quadrangular, bearing one leaf only, at the lower part, which is flat, short and broad, with a long striated sheath, and a more elongated stipula than that of the other species. Radical leaves larger and narrower, folded, numerous. Spike almost globular, the size of a common currant, subtended by two or three opposite, broad, concave, notched, membranous, coloured bractæas, not half its own length. Spikelets imbricated every way, of a blueish-purple, nearly sessile. Each calyx contains two or three florets. The petals are divided as in *S. cerulea*, but the middle segment of the outer one is lengthened out into an awn, of a dark hue, twice or thrice as long as the rest. Wulfen, who communicated this species, and its description, to Jacquin, observed what he supposed a variety, with white flowers, in rather larger spikes, four or five florets in each calyx, and a shorter central awn to the corolla. This seems to be represented in Jacquin's plate, and Hoffmann, after Hænk and Hopp, has made it a distinct species, by the name of *Cynofurus sphaerocephalus*, calling our's *microcephalus*. We do not see sufficiently permanent characters to authorize this. Haller makes another *Sesleria*, at his n. 1447, which is *Poa disticha*, Jacq. Misc. v. 2. 74. Ic. Rar. t. 19. Willd. Sp. Pl. v. 1. 400. Allioni has given it the barbarous appellation of *P. seslerioides*. This plant is unquestionably a true Poa, see that article.

SESOSTRIS, in *Biography*, king of Egypt, of whom the accounts are so much mixed with fable, and so obscured by antiquity, that it has been found extremely difficult to form a consistent and probable story. Historians are even divided as to the identity of the name Sesostris with that of some other resembling names in the Egyptian history, and several hold him to be the same with the Sefac or Shefac of the Hebrew scriptures. The following is regarded as the most probable account of this monarch. He is generally placed by chronologers in the 15th century B.C., and is by some thought to have been the son of Amenophis. Educated in many exercises with a number of companions, he is said to have been sent, by his father, at an early age, upon an expedition into Arabia; and after subduing that country, into Africa. While engaged in the conquest of the latter, his father died; and his successes having inflamed his ambition, he resolved to grasp at universal empire. Before his

his departure from Egypt, he ingratiated himself with the people by many acts of kindness, and made a division of the country into thirty-six departments, to each of which he assigned a governor. Then having constituted his brother Armais regent, he marched with a numerous army into Ethiopia, which he rendered tributary, penetrating near to the straits of Babelmandeb. As he now perceived that he could not carry on his great designs without a navy, he fitted out two fleets, notwithstanding the aversion of the Egyptians to maritime occupations, one in the Mediterranean and the other in the Red sea. By means of the former he reduced the courts of Phœnicia, Cyprus, and several of the Cyclades, and with the latter he sailed into the Indian gulf, and made himself master of its coasts. Then, pursuing his conquests by land, he is represented as having over-run all Asia, and even as having crossed the Ganges. On his return, he invaded the country of the Scythians and Thracians, in which, however, he lost a great part of his army. It is commonly thought that he left an Egyptian colony at Colchos, but Thrace was his farthest progress westward. On his arrival at Pelusium, after an absence of nine years, laden with spoils, and attended with a vast number of captives, he was received by his brother Armais with pretended joy and submission, though he had formed a plot against him. For this traiterous attempt he expelled Armais from Egypt, and then, disbanding his army, he sat down to the improvement of his country. He erected magnificent temples in all the cities of Egypt, in the building of which none but his captives were employed. He raised obelisks, with inscriptions recording his conquests and revenues. He built a wall of great length, on the eastern boundary of Egypt, to protect it from the incursions of the Arabians, and he dug a number of canals, branching from the Nile in all directions, for the purpose both of commerce and navigation. He is said, in the height of his pride, to have harnessed tributary kings to his chariot, till one of them, pointing out to him the rotation of the wheels, by which each part was successively at top and bottom, brought him to reflection. Becoming blind in his advanced years, he finished his course by a voluntary death.

It may be observed that sir Isaac Newton has endeavoured to prove that Sesostris is the Osiris of the Egyptians, and the Bacchus of the Greeks, as well as the Sefac of scripture. Univer. Hist.

SESQUI, a particle often used by old masters and theorists, in *Music*, in the composition of words to express different kinds of measure. They called sesquialter measures those which contain notes equal to one-third more than their usual value; that is, when equal to three notes of less value, instead of two. This happened in what was called *perfect time*, before the use of points or dots, when the breve was equal to three semibreves, the semibreve to three minims, &c.

In Italian treatises by old theorists, sesqui is much used to express a kind of ratio, particularly in different species of triples; that is, when the greater term contains the less once, and some small quantity more; as 3 : 2, when the first term contains the second, and unity over, which is the half of 2. So that if the part remaining be just half the less term, as 4 : 3, the ratio is called *sesqui terza*, or *tertia*; if a fourth, or 5 : 4, the ratio is *sesqui quarta*, and so on to infinity; still adding to sesqui the ordinal number of the less term.

SESQUIALTER is a stop in the organ, implying a whole and a half. In large organs this stop has usually five ranks of pipes, each note having one sound in unison with the diapason, one with the principal, one with the twelfth, and one with the fifteenth.

SESQUI-ALTERATE, *the greater perfect*, which is a triple where the breve is three measures, or semi breves, and that without having any point or dot annexed to it.

SESQUI-ALTERATE, *greater imperfect*, which is where the breve, when pointed, contains three measures, and without any point, two.

SESQUI-ALTERATE, *lesser perfect*, which is where the semibreve contains three measures, and that without any point.

SESQUI-ALTERATE, *lesser imperfect*, a triple, where the semibreve, with a point, contains three measures, and two without.

According to Buontempi, one may likewise call the triples $\frac{3}{2}$ and $\frac{1}{2}$, sesqui-alterates.

SESQUI-ALTERATE, in *Geometry* and *Arithmetic*, is a ratio between two lines, two numbers, or the like, where one of them contains the other once, with the addition of a half.

Thus 6 and 9 are in a sesqui-alterate ratio; since 9 contains 6 once, and 3, which is the half of six, over; and 20 and 30 are in the same; as 30 contains 20, and half 20 or 10.

SESQUIDITONE, in *Music*, a concord, resulting from the sounds of two strings, whose vibrations, in equal times, are to each other in the ratio of 5 to 6. See **DITONE** and **INTERVAL**.

SESQUIDUPLICATE RATIO, is when of two terms, the greater contains the less twice, and half the less remains; as 15 and 6; 50 and 20.

SESQUI-OCTAVE, is a kind of triple, marked C_3 , called by the Italians *nonupla di crome*, where there are 9 quavers in every measure or bar, in lieu of 8.

SESQUIQUADRATE, an aspect, or position of the planets, when at the distance of four signs and a half, or 135 degrees, from each other.

SESQUI-QUARTA, **DUPLA**, is a kind of triple, marked C_3 , called by the Italians *nonupla di sememinime*, where there are 9 crotchets in each measure, instead of 4; that is, three crotchets to each time.

SESQUIQUINTILE, an aspect of the planets, when 108 degrees distant from each other.

SESQUITERTIONAL PROPORTION. When any number or quantity contains another once and one-third, they are sesquitertional proportions.

SESSA, in *Biography*, an Indian philosopher and mathematician, and the inventor of the game of chess, which he communicated to his sovereign Scheram, who was so pleased with it, that he ordered him to demand what he pleased as a reward for his ingenuity. Sessa asked only for a single grain of wheat to be laid on the first square, two on the second, four on the third, and so on in progression through the sixty-four squares. The king, offended that he should demand so mean a gift, directed that he should have just what he asked, and no more; but upon coming practically to the business, it was, in a very short time, found that all the granaries in the kingdom would not supply the demand. Scheram, astonished at the fact, crowned Sessa with very high honours. He lived about the eleventh century.

SESSA, in *Geography*, a town of Naples, in Principato Citra; 23 miles S.W. of Cangiano.

SESSA. See **SEZZA**.

SESSEA, in *Botany*, a Peruvian genus of plants, dedicated by the authors of the splendid Flora Peruviana, to the honour of a Spanish botanist, named Martin Sesseo, to whom the care of the botanic garden at Mexico was entrusted. —Poirot in Lamarck Dict. v. 7. 139. "Ruiz and Pavon, Fl. Peruv. v. 2. 9." —Class and order, *Pentandria Monogynia*. Nat. Ord. *Lurida*, Linn. *Solanææ*, Juss.

Gen.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, with five angles, each angle terminating in an oval tooth, permanent. *Cor.* of one petal, funnel-shaped; tube as long again as the calyx; throat globular; limb plaited, in five deep, straight, oval segments, revolute at their margin. *Stam.* Filaments five, inserted towards the middle of the tube, curved and downy at their base, as long as the tube; anthers oval, of two cells. *Pist.* Germen superior, small, oblong; style terminal, thread-shaped, the length of the stamens; stigma of two unequal lobes. *Peric.* Capsule cylindrical, slightly curved, as long again as the calyx, of one cell, and two cloven valves. *Seeds* numerous, imbricated, oblong, compressed, each encompassed with a membranous border.

Eff. Ch. Corolla funnel-shaped. Calyx tubular, with five angles, and five teeth. Stamens simple. Stigma of two unequal lobes. Capsule of one cell and two cloven valves. Seeds numerous, bordered.

1. *S. stipulata*. "Fl. Peruv. v. 2. 9. t. 115. f. B."—"Leaves lanceolate, or heart-shaped. Clusters panicked."—Native of cool situations, on the mountains of Peru, flowering in June and July. A fetid shrub, five or six feet high, having the aspect of a *Cestrum*. The branches are straight, leafy, alternate. Leaves alternate, stalked, mostly lanceolate, heart-shaped at the base; others, especially the upper ones, narrower, oval, oblong, entire, pointed, from three to five inches long, and one or two broad, smooth above, white and downy beneath. Stipules at the base of the footstalks, equal to them in length, opposite, large, oval, obtuse, sessile, a little heart-shaped at the bottom, deflexed at the sides, deciduous. Panicles terminal, composed of straight, downy clusters, with corymbose stalks, of yellow downy flowers, accompanied by small, awl-shaped, deciduous bracteas.

2. *S. dependens*. "Fl. Peruv. v. 2. 9. t. 116."—"Leaves oblong, heart-shaped. Clusters very long, pendulous."—Native of the banks of rivers in Peru, flowering in November, December, and January. A tree, twenty-five or thirty feet high, agreeing in many respects with the foregoing, but the leaves are very powdery at the back, and the clusters very long, simple, and pendulous, slightly zigzag. The flowers are usually placed three together, in alternate sessile tufts. Calyx powdery. Corolla with a black tube, and yellowish limb, externally downy. Capsules black.

Both species are esteemed emollient anodyne. *Poir.*

SESSEI, in *Geography*, a town of Bengal; 5 miles N.W. of Doefa. N. lat. 23° 4'. E. long. 84° 58'.

SESSENREUTH, a town of Germany, in the principality of Culmbach; 10 miles N. of Bayreuth.

SESSERRY, a town of Hindoostan, in Oude; 13 miles S. of Lucknow.

SESSILE, in *Botany*, a term applied to any part of the herbage or flowers of a plant, that is not elevated on any kind of stalk; from the Latin *sessilis*, sitting close. Many plants bear *stems sessile*, sessile flowers, on the branches; very few at the root, like *Crocus*, *Colchicum*, and *Aphyteia*. It is not unusual for the fructification, though sessile at the flowering period, to become stalked as the fruit advances toward maturity. The germen is so usually sessile, as seldom to require to be so described, it being sufficient to notice a stalked germen, whenever such occurs, as affording mostly an important generic character. For *folia sessilia*, sessile leaves, see LEAF.

SESSILE *Roots*, such tuberous roots as adhere to the base of the stalk. See ROOT.

SESSION, *Session*, denotes each fitting, or assembly, of a council.

In quoting councils, we say, in such a session, such a canon, &c.

SESSION of *Parliament*, is a season, or space, from its meeting to its prorogation, or dissolution. See PARLIAMENT.

SESSION, in *Law*, denotes a fitting of justices in court, upon their commission. As the session of oyer and terminer, of gaol-delivery, &c. See ASSISES, JUSTICES of Assise, JUSTICES of Gaol-delivery, JUSTICES of Oyer, &c.

SESSIONS of *Wales*, Great. See COURTS of *Wales*.

Quarter-sessions, called *general sessions*, or *open sessions*, stand opposite to *special*, otherwise called *petty sessions*, which are procured upon some special occasion, for the more speedy dispatch of justice. See QUARTER-sessions.

Statute-sessions, are those kept by a high-constable of a hundred, for the placing of servants, &c. See STATUTE.

SESSIONS for *Weights and Measures*. In London, four justices from among the mayor, recorder, and aldermen, (of whom the mayor or recorder is to be one), may hold a session to enquire into offences of selling by false weights and measures, contrary to the statutes; and to receive indictments, punish offenders, &c. Char. K. Cha. I.

SESSION, *The Court of*, otherwise called the college of justices, is the supreme court in Scotland for all civil causes. It consists of one constant president, who has an annual salary of 1300*l.* and fourteen other judges, at 700*l.* per annum each, who are lords by their office, which they hold by patent *quamdiu se bene gesserint*. The lord high chancellor presides here when present. The king names several other extraordinary lords, who fit, but are not obliged to give attendance, because they have no salaries; but they may vote among the rest.

The court sits from the first of November, old style, to the last of February, and from the first of June to the last of July, all inclusive; which holds of all the inferior courts or judicatories in Scotland. In time of session, or term, they sit from nine o'clock to twelve in the forenoon, every day in the week but Sunday and Monday; sometimes they sit in the afternoon, to end concluded causes, or to hear such long debates as the forenoon was too short to hear, which gives a great dispatch to causes that come before them. The lords, both ordinary and extraordinary, when in the inner house, sit on a semicircular bench in their robes; where the advocates debate their clients' causes before them. There are six principal clerks belonging to this court. Nine of the lords make a quorum in the inner house, otherwise they cannot vote in any case, except such as are referred to one or more of the whole lords; and one of the ordinary lords (the president being always excepted) is weekly appointed judge in the outer house, for discussing of ordinary actions, and has six under clerks to attend him. He meddles with no extraordinary cases, except where it is remitted to him by all the lords, to be discussed in the outer house for dispatch.

That the lords may have time to read informations, petitions, &c. and the suitors be eased of the trouble of going with them to their houses, every lord has a box standing upon a table in the waiting room in the inner house, from two to four o'clock in the afternoon, every day; wherein all who have papers to offer, may put them by a slit in the cover. Each of the principal clerks have also a box, and parties must put in their bills, answers, or informations of causes to be reported, into the clerk of the process's box.

The rolls of the court bring in all causes in their due order. Causes of the greatest consequence are at first advised by the whole lords in the inner house. Other causes are called of course before an ordinary in the outer house, who decides the controversy, if clear, without farther trouble or expence; and, in case of difficulty, takes some little time

to advise it himself, or to advise with the whole lords upon it. And if any of the parties think themselves wronged by the sentence of the ordinary, they may complain to the lords, and get their answer upon a bill.

An appeal lies from this court to the house of lords.

The lords of *session* were first appointed by James I. of Scotland, who selected, among the estates of parliament, a certain number of persons; and distinguished them by this appellation. They were empowered to hold courts for determining civil causes three times a-year, and forty days at a time, in whatever place he pleased to name. James IV. on pretence of remedying the inconveniences arising from the short terms of the court of *sessions*, appointed other judges, called lords of *daily council*. The session was an ambulatory court, and met seldom; the daily council was fixed, and sat constantly at Edinburgh; and though not composed of members of parliament, the same powers which the lords of session enjoyed, were vested in it. At last, James V. erected the new court that still subsists, and which he called the college of justice, the judges or senators of which were called lords of council and session. Robertson's Hist. of Scotland, 1776, 8vo. vol. i. p. 40.

SESSIONS, *Kirk*. See *KIRK*.

SESSLACH, in *Geography*, a town in the duchy of Wurzburg; 50 miles N.E. of Wurzburg.

ESSOAH, a town of Bengal; 21 miles S. of Doefa.

SESTA, a town of the Ligurian republic; 5 miles N.W. of Brugnello.

SESTA, Ital. the interval and consonant of the sixth, in *Music*. See *HEXACHORD*, and *HEXACHORDON*.

SESTERCE, SESTERTIUS, a silver coin, in use among the ancient Romans, called also simply *nummus*, and sometimes *nummus sestertius*.

The sesterce was the fourth part of the denarius, and originally contained two asses and a half.

The sesterce was at first denoted by LLS; the two L's signifying two librae, and the S half. But the librarii, afterwards converting the two L's into an H, expressed the sesterce by HS.

The word *sestertius* was first introduced by way of abbreviation for *semisestertius*, which signifies two, and a half of a third, or, literally, only half a third; for in expressing half a third, it was understood that there were two before. Hence *sestertius* came to be the great estimate of Roman money.

Some authors make two kinds of sesterces: the less, called *sestertius*, in the masculine gender; and the great one, called *sestertium*, in the neuter: the first, that which we have already described; the latter containing a thousand of the other. Others will have any such distinction of great and little sesterces unknown to the Romans: *sestertius*, say they, was an adjective, and signified as *sestertius*, or two asses and a half; and when used plurally, as in *quingaginta sestertium*, or *sestertia*, it was only by way of abbreviation, and there was always understood *centena, millia, &c.*

This matter has been accurately stated by Mr. Raper, in the following manner. The substantive to which *sestertius* referred is either *as*, or *pondus*; and *sestertius as* is two asses and a half; *sestertium pondus*, two pondera and a half, or two hundred and fifty denarii. When the denarius passed for ten asses, the sesterce of two asses and a half was a quarter of it; and the Romans continued to keep their accounts in these sesterces long after the denarius passed for sixteen asses; till, growing rich, they found it more convenient to reckon by quarters of the denarius, which they called *nummi*, and used the words *nummus* and *sestertius* indifferently, as synonymous terms, and sometimes both together, as *sestertius nummus*; in which case, the word *sestertius* having lost its original

signification, was used as a substantive; for *sestertius nummus* was not two nummi and a half, but a single nummus of four asses. They called any sum under two thousand sesterces so many *sestertii* in the masculine gender; two thousand sesterces they called *duo* or *бина sestertia*, in the neuter; so many quarters making five hundred denarii, which was twice the *sestertium*; and they said *dena, vicena, &c. sestertia*, till the sum amounted to a thousand *sestertia*, which was a million of sesterces. But, to avoid ambiguity, they did not use the neuter *sestertium* in the singular number, when the whole sum amounted to no more than a thousand sesterces, or one *sestertium*. They called a million of sesterces, *decies nummum*, or *decies sestertium*, for *decies centena millia nummorum*, or *sestertiorum* (in the masculine gender), omitting *centena millia*, for the sake of brevity. They likewise called the same sum *decies sestertium* (in the neuter gender) for *decies centies sestertium*, omitting *centies* for the same reason; or simply *decies*, omitting *centena millia sestertium*, or *centies sestertium*; and with the numeral adverbs, *decies, vicies, centies, millies*, and the like, either *centena millia*, or *centies*, was always understood. These were their most usual forms of expression; though for *бина, dena, vicena sestertia*, they frequently said *бина, dena, vicena millia nummum*. If the consular denarius contained sixty troy grains of fine silver, it was worth somewhat more than eight-pence farthing and a half sterling; and the as, of sixteen to the denarius, a little more than a half-penny. To reduce the ancient sesterces of two asses and a half, when the denarius passed for sixteen, to pounds sterling, multiply the given number by 5454, and cut off six figures on the right hand for decimals. To reduce *nummi sestertii*, or quarters of the denarius, to pounds sterling; if the given sum be consular money, multiply it by 8727, and cut off six figures on the right hand for decimals; but for imperial money, diminish the said product by one-eighth of itself. Phil. Trans. vol. lxi. part ii. art. 48. See *DENARIUS* and *DRACHM*.

To be qualified for a Roman knight, an estate of four hundred thousand sesterces was required; and for a senator, of eight hundred thousand.

Authors also mention a copper sesterce, worth about one-third of a penny English.

SESTERCE, *Sestertius*, was also used, in *Antiquity*, for a thing containing two wholes and a half of another: as *as* was taken for any whole, or integer.

SESTINI, La SIGNORA, in *Biography*, engaged as a prima *buffa* in the comic opera, arrived in England from Lisbon in 1774; and her first performance was in Aufossi's comic opera, entitled "*La Marchesa Giardiniera*." Her face was beautiful, her figure elegant, and her action graceful. Her voice, though by nature not perfectly clear and sweetly toned, had been well directed in her studies, and she sung with considerable agility, as well as taste and expression.

She was married to a young man of family at Lisbon, by which imprudent step he had totally lost all parental favour, and even support; so that, instead of being an auspicious match for herself, she had him and a large family to maintain by her talents; which not being of the first class, were soon disregarded by the public. And after languishing some years unemployed, she went with her helpless husband and family to Italy, where, it is to be feared, they suffered all the melancholy mortifications of extreme indigence.

SESTO, CESARE, known by the name of *Cesare Milanese*, was a native of Milan, and flourished about the year 1500. He is one of those painters by whom probably were executed some of the many pictures attributed to Lionardo da Vinci; and in the Ambrosian library was a head by him often attributed to Lionardo. In some of his works he also

imitated Raphael, to whom he was known. He died at Milan in 1524.

SESTO, in *Geography*, a town of Italy, in the Milanese; 28 miles W.N.W. of Milan.—Also, a town of Italy, in Friuli; 5 miles N. of Concordia.

SESTOLA, a town of Italy, in the department of the Panaro; 17 miles S. of Modena.

SESTOS, a fortress of European Turkey, in the province of Romania, opposite to Abydos; 24 miles S.S.W. of Gallipoli. N. lat. $40^{\circ} 6'$. E. long. $26^{\circ} 25'$. *Abydos* (which see) and *Sestos* were two towns, opposite one another at the most narrow part of the Hellespont: they were famous for the love-adventures of Leander, who lived at Abydos, and Hero, a priestess of Venus, at Sestos. Leander swam across the Hellespont to visit his mistress, guided by a torch, which she lighted on the top of a tower; but, in a tempestuous night, Leander, having too imprudently committed himself to the waves, could not reach the other shore, and was unfortunately swallowed up by the agitated waters. Hero, in true despair, threw herself into the sea, in order to share the fate of her lover. Procopius places Sestos in the cove the nearest to Abydos; and he adds, that the emperor Justinian caused a citadel to be built near that city: the remains of this citadel are still to be seen close to the sea-shore. On the declivity of the hill, the walls of the ancient city may very easily be traced. Four miles from Sestos, on ascending the channel, is another harbour, near which is seen only a single habitation of dervises, occupied by three or four Mussulman monks.

SESTOS, a river which rises in the mountains of Sierra Leone, traverses the Grain Coast, and runs into the Atlantic, N. lat. $5^{\circ} 30'$.

SESTRE, *Grand*, or *Great Paris*, a town of Africa, on the Grain Coast, being one of the largest commercial towns of the country. N. lat. $4^{\circ} 16'$. W. long. $8^{\circ} 20'$.

SESTRE, *Petit*, or *Little Paris*, a town of Africa, on the Grain Coast, near Grand Sestre.

SESTRE-KRO, or SETTRA-KROO, a town of Africa, being the chief town of the Kroo country, which extends along the Grain Coast, between Cape Mount and Cape Palmas, from $5^{\circ} 54'$ to $5^{\circ} 7'$ N. lat. The chief town is in long. $7^{\circ} 48'$. This district, though small, is extremely populous, and the natives are of a migratory disposition. Above 800 are employed as labourers at Sierra Leone; and they are to be found at every factory and town along the coast for a space of 350 miles. They are employed as factors or intermediate merchants, boatmen and sailors; and while the slave trade was carried on upon this coast, they had their share of its occupations. After the age of forty, they return and settle at home. Their country produces grain, particularly fine rice, pepper, and cattle; but their staple article is their own labour, with which they purchase goods, and return to their homes with the produce. Wars are rare among this people; they never sell one another, nor kill their captives; nor do they punish any offence by slavery, though witchcraft among them is a capital offence, and the only one that is invariably so among them. One of the most singular parts of the character of the Kroomee, is their extreme love for their own country, and their confident belief in its vast superiority over all others. Every action of their lives bears a reference to it. With regard to their talents and acquirements, they are sufficiently acute and observant, where the occasion calls their minds into action. They have not the use of letters, nor will they permit their children to learn; their language in conversation is very bad; and as they live by daily labour, which is paid for in European goods,

they have no occasion for manufactures of their own, and of course no opportunity for displaying their talents. They make their own canoes, some implements of agriculture, and a few musical instruments.

SESTRI *di Levante*, a town of the Ligurian republic; 12 miles W. of Brugnnetto.

SESTRI *di Ponente*, a town of the Ligurian republic; 4 miles W. of Genoa.

SESTUPLA, Ital. in *Musica*. See SEXTUPLA.

SESVAH, or RAMGUR, in *Geography*, a town of Hindoostan, in Bahar; 22 miles E.S.E. of Bettiah.

SESVIVIUM, in *Botany*, a Linnæan name, whose derivation we are unable to trace. Loefling originally called it *Halimum*.—Linn. Gen. 250. Schreb. 338. Willd. Sp. Pl. v. 2. 1009. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 3. 205. Jacq. Amer. 155. Swartz Obf. 204. Juss. 316. Lamarck Dict. v. 7. 141. Illustr. t. 434.—Class and order, *Icosandria Trigynia*. Nat. Ord. *Succulentæ*, Linn. *Ficoideæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, bell-shaped, deeply cloven into five, ovate, acute, withering segments, coloured on the inside. *Cor.* none. *Stam.* Filaments numerous, awl-shaped, shorter than the calyx and inserted at its base; anthers roundish. *Pist.* Germen superior, oblong, at the bottom of the calyx, triangular at the upper part; styles mostly three, capillary, erect, the length of the stamens; stigmas simple. *Peric.* Capsule ovate, of three cells, bursting all round. *Seeds* rounded, flattish, with a beak at the margin.

Ess. Ch. Calyx deeply five-cleft, coloured. Petals none. Capsule ovate, three-celled, bursting all round, many-seeded.

1. *S. Portulacastrum*. Purslane-leaved Sesuvium. Linn. Sp. Pl. 684. Jacq. Amer. t. 95. (*Portulaca aizoides maritima procumbens*, flore purpureo; Sloane Jam. v. 1. 204. *Crithmus indicus*; Rumph. Amboin. v. 6. 165. t. 72. f. 1.)—Stem round. Leaves opposite, oblong. Flower-stalks solitary, much shorter than the leaves.—Native of the West Indies, in maritime situations; flowering in July and August.—*Root* perennial. *Stems* succulent, four or five inches long, round, thick, diffuse, branched, at first procumbent, then erect. *Leaves* on short stalks; fleshy, bright green; their stalks sheathing, with membranous edges. *Flowers* solitary, axillary, green on the outside, white and blood-red or purple on the inside, inodorous. *Seeds* black.—The whole plant is very succulent, and abounds with a neutral-alcalescent salt, which is easily extracted, and would probably serve as a substitute for *Kali*.

2. *S. revolutifolium*. Revolute-leaved Sesuvium. "Ortega. Pl. Decad 2. 19." Lamarck Illustr. t. 434. f. 2.—Stems square. Leaves obovate-oblong, reflexed at the sides. Flowers sessile.—Native of the Isle of Cuba, flowering in August. *Stems* herbaceous, succulent, much branched, forked. *Leaves* opposite, stalked, entire, revolute at their edges; stalks slightly embracing the stem, furnished on each side with a whitish membrane, like a wing. *Flowers* solitary, the upper ones perfectly sessile, of a purple colour. *Seeds* kidney-shaped, black.

SET, a term used for a pole or shaft, used to shove boats along a canal, &c.

SET is also a term signifying to let, as land.

SET, in *Agriculture* and *Gardening*, a term used in Ireland to signify a sort of ridge. It also signifies a cutting of any sort of fleshy root, shrub, or tree of the fruit kind. Likewise any sort of young plant from the seed-bed to be planted out.

SET-off, in *Law*, is an act, by which the defendant acknowledges

knowledges the justice of the plaintiff's demand on the one hand; but, on the other, sets up a demand of his own, to counterbalance that of the plaintiff, either in the whole, or in part: as, if the plaintiff sues for ten pounds due on a note of hand, the defendant may set-off nine pounds due to himself for merchandize sold to the plaintiff; and, in case he pleads such set-off, must pay the remaining balance into court. This answers very nearly to the *compensatio*, or stoppage, of the civil law, and depends upon the statutes 2 Geo. II. cap. 22. and 8 Geo. II. cap. 24.

SET-off, in *Inland Navigation*, is a recess, as I K (*Plate I. Canals, figs. 3 and 6.*), on the bank of a canal, and has the same meaning with bench or berm.

SET-Bolts, in a *Ship*. See **BOLTS**.

To SET sail. See **SAIL**, and **SETTING**.

SETACEUS VERMIS, in *Natural History*, a name given by Dr. Lister to that long and slender water-worm, which so much resembles a horse-hair, that it has been supposed by the vulgar to be an animated hair of that creature. These creatures, supposed to be living hairs, are a peculiar sort of insects, which are bred and nourished within the bodies of other insects, as the worms of the ichneumon-flies are in the bodies of the caterpillars. See **AMPHISBÆNA Aquatica**.

SETAH, in *Botany*, a name used by the oldest writers for the acacia. It is an original Hebrew word, and is explained by the lexicographers, by a thorn growing in the desert. It is rendered by Theodotion *acantha*, one of the names of the acacia.

SETAPOUR, in *Geography*, a town of Hindoostan, in Golconda; 30 miles N.N.W. of Rachore.

SETARIA, in *Botany*, from *seta*, a bristle, a name given by Acharius, in his *Prodromus Lichenographiæ Suecicæ*, to the 27th tribe of the great genus *Lichen*. It comprehends seven species, of what have usually been termed filamentous lichens, as *jubatus*, *chalybeiformis*, &c. See **LICHENES**.

SE-TCHEOU, in *Geography*, a city of China, of the first rank, in Koei-tcheou, in a mountainous country, yielding cinnabar and quicksilver; 982 miles S.S.W. of Peking. N. lat. 27° 10'. E. long. 108°.

SE-TCHIN, a town of China, of the second rank, in Quang-fi; 1167 miles S.S.W. of Peking. S. lat. 22° 48'. E. long. 136° 31'.

SE-TCHING, or **SE-TCHIN**, a city of China, of the first rank, in Quang-fi; 1100 miles S.S.W. of Peking. N. lat. 24° 17'. E. long. 105° 54'.

SE-TCHUEN, a province of China, bounded on the N. by Chen-fi, on the E. by Hou-quang, on the S. by Koei-tcheou, and on the W. by the kingdom of Thibet and some other neighbouring countries. This province comprehends, besides a great number of forts and strong places, 10 cities of the first class, and 88 of the second and third. The great river Yang-tse-kiang traverses Se-tchuen, which is opulent, not only on account of the abundance of silk it produces, but also for its mines of iron, tin, and lead; its amber, sugar-canes, loadstone, lapis lazuli, musk, and horses, which are in great request; also for its rhubarb, and the root fou-lin, which the Chinese physicians introduce into all their prescriptions; and for a thousand other useful productions, which it would be tedious to mention. This province, which is at a great distance from the sea, obtains the salt which it consumes from its mountains, where the inhabitants dig pits, that furnish them with it in great abundance. Its capital is *Tching-tou*; which see. The population of this province, according to sir John Staunton, is estimated at 27,000,000

SETEEF, a town of Africa, anciently called *Sitipha*, and capital of a part of Mauritania, which made a stout resistance against the Saracens. There is scarcely one fragment left, either of the ancient walls, pillars, or cisterns of the Romans; the few remaining structures being obviously the work of the later inhabitants. The fountains, which continue to flow very plentifully near the centre of the city, are equally delightful and convenient; and without doubt gave occasion formerly for many ingenious and useful contrivances in the distribution of the water; 50 miles S.W. of Constantina. N. lat. 35° 58'. E. long. 5° 36'.

SETERRA, or **SETRES**, a town of Africa, on the Grain Coast.

SETHIANS, **SETHEDIANS**, *Sethiani*, or *Sethiniani*, in *Ecclesiastical History*, a branch of the ancient Gnostics; thus called, because of their pretending to deduce their origin from Seth, son of Adam, whom they called Jesus and Christ; from an opinion, that Seth and Jesus were the same person, who came down from heaven at two several times.

As the Sethians had the same philosophy with the other Gnostics, they had numerous other fables in their system. They pretended to have several books of the ancient patriarchs; particularly, seven of their great master Seth; besides one of Abraham, which was full of manifest falsities, which yet they called *Apocalypse*, or *Revelation*. The book called the "Little Genesis," anciently very common in the churches of the East, was borrowed from them. From this book they learned the name of Seth's wife, who, they say, was called *Horeæ*. Some imagine, they borrowed a great many of their fictions from the Hellenist Jews.

SETHRON, in *Geography*, a town of Egypt, on the S. coast of the lake Menzaleh; 16 miles W. of Tineh.

SETICAUDÆ, in *Natural History*, a term used to express such flies as have one or more hairs growing out at their tails. There are many species of these distinguished by their having one, two, or three hairs.

SETIER. See **SEPTIER**.

SETINES, in *Geography*. See **ATHENS**.

SETIO, a mountain in the E. part of the Tyrolese.

SETLANA, a town of Hindoostan, in the circar of Sirowy; 35 miles N.W. of Sirowy.

SETLE', a town of Turkish Armenia; 30 miles S.W. of Akalziké.

SETLEDGE, a river of Hindoostan, which rises in the mountains of Thibet, and runs into the Indus, near Veh, anciently called *Hesudrus*.

SETON, a river of Spain, which runs into the Gallego, in the province of Aragon.

SETON, *Setaceum*, denotes, in *Surgery*, a skein of silk or thread, introduced through a part of the flesh by means of a needle, and left there so as to keep up a continual discharge of matter, and a degree of counter-irritation, with a view of relieving or curing a variety of diseases. In a few cases, setons are employed on another principle. When sinuses and fistulæ have lost all disposition to heal, in consequence of a want of action in the parts affected, a seton, passed through the track of the disease, will sometimes excite a salutary kind of inflammation, which brings on the healing process. Great judgment, however, is necessary in the application of a seton to this purpose; for, unless the sinus be prevented from healing merely by the cause above specified, namely, a want of action in the parts, no success can be expected to attend the practice, and the patient will be put to much unnecessary pain and inconvenience.

A seton is also sometimes employed as a means of discharging

charging the contents of large chronic abscesses. It is thought by some practitioners that this method has the advantage of letting the matter escape very gradually, a circumstance, by which the dangerous effects, often arising from emptying the abscess all at once, are in a great measure avoided. Many surgeons even suppose that setons hinder the external air from getting into the cavity of the abscess, and, as prejudice and exaggeration have filled their minds with serious apprehensions upon this subject, they are perhaps more attached to the practice than any recommendations which it really possesses would justify.

Formerly, setons were frequently used for accomplishing the radical cure of the hydrocele. The celebrated Mr. Pott was an advocate for this method, which he certainly brought to great perfection. It is scarcely necessary for us to remark here, that the seton excited the requisite degree of inflammation in the cavity of the tunica vaginalis testis, and the adhesion of its opposite surfaces to each other. See HYDROCELE.

The common mode of making a seton is with a flat broadish needle, which is somewhat curved towards the point, and furnished with cutting edges. This form enables the surgeon to bring the needle out of the part again without any difficulty. The integuments are pinched up into a fold, of which the operator raises one end with the fore-finger and thumb of his left hand, while an assistant raises the other. The needle, armed with the silk or thread dipped in sweet oil, is then to be pushed through the skin thus lifted up. It is only necessary to draw the end of the silk or thread a little way out of the second aperture: the needle may now be removed. The next object is to fix the ends of the silk, which is usually done with adhesive plaster. The wounds are then to be covered with pledgets, and a retentive bandage. The oil prevents the silk from adhering to the flesh, and facilitates its passage through the wound; for, as soon as suppuration has taken place, that part of the silk which is in the wound is to be drawn out and cut off. The same method is to be repeated every day, and the same plan of dressing continued. When the skein of silk is exhausted, a new one, oiled in the above manner, is to be introduced by means of an eye-probe.

Setons, unless kept exceedingly clean, and dressed with much tenderness, sometimes excite a great deal of irritation, and prove very troublesome to the patient. The thread is also apt, with the least neglect, to cut its way out, and leave an ugly sore.

When a seton is made in a case of large chronic abscess, a puncture is first made in the upper part of the tumour; an eye-probe, armed with a skein of silk, is introduced downward; and the end of the instrument being felt against the inside of the lower part of the swelling, an incision is made upon it, so that the end of the silk can then be drawn out.

The manner of making a seton for the cure of hydroceles has been described in a former volume. See HYDROCELE.

The like operation is frequently practised on horses, &c. and called, by the farriers, *rowelling*.

SETOSCH, in *Geography*, a town of Bohemia, in the circle of Chrudim; 8 miles S.S.W. of Chrudim.

SETRA-JETA, the name, in Hindoo romance, of the father of one of the favourite wives of the popular deity Krishna. Her name was Satyavama; and she is sometimes said to have been an incarnation of Lakshmi, consort of the god Vishnu. See those articles.

SETS, in *Agriculture and Gardening*, a term applied to

the cuttings or planted parts of potatoes, hops, liquorice, lavender, &c.

It has lately been found to be of material consequence for the sets which produce the plants, in some cases, to have a large substance for their early nourishment and support, as in those of the potatoe; as though the small parts, called *eyes* or *buds*, will grow and produce crops, they are far from being equal to those where the sets are of a large size. In short, the result of various experiments has shewn that crops of this sort prove, *ceteris paribus*, abundant or otherwise, nearly in proportion to the size of the sets. Therefore, as there is no material saving produced by the use of small sets or cuttings of this root, while the difference in the quantity of produce is from one hundred to one hundred and fifty bushels the acre, the practice of employing such small sets in planting should be discontinued in all situations; and for the very same reason that heavy well-fed corn, when otherwise in good condition, should, in all cases and circumstances, be preferred to that which is light. See POTATOE and SEED.

SETSE, in *Botany*, the name of a Chinese tree, called also *chitse*, and much esteemed by the people of that country for its beauty, and for the goodness of its fruit. In the provinces of Cantong and Honan there are whole plains covered with these trees, many of which grow to the size of our walnut-tree. The fruit ripens every where in the East, where the tree grows, but it is of a much more delicious flavour in some places than in others. The leaves are of the colour and shape of those of the walnut-tree, only that they are more round at the ends. The fruit is sometimes round, sometimes pointed at one end, sometimes oval, sometimes flat, and not unfrequently composed of two pieces, as it were, and resembling two apples, cut and joined together. The rind is always green, never changing yellow or red, and the fruit keeps its freshness all the winter. They are about the size of the orange, and the skin is very tender and thin, and the fruit has a mixed taste of the sharp and the luscious. It is very wholesome and good.

SETTE, in *Geography*, a town of Africa, and capital of a country of the same name, subject to Loango, on the river Setté; 160 miles north of Loango.—Also, a country of Africa, south of cape Lopez Gonfalso, watered by a river of the same name. This country is governed by a man, who is subject to the king of Loango.—Also, a river of Africa, which runs into the Atlantic, S. lat. 2° 15'.

SETTEE, in *Sea Language*, a vessel, very common in the Mediterranean, with one deck, and a very long and sharp prow. They carry, some two masts, some three, without top-masts. They have generally two masts, and are rigged and navigated like xebecs or galleys, with sette sails instead of lateen sails. The least of them are of sixty tons burden. They serve to transport cannon, and provisions for ships of war, and the like. These vessels are peculiar to the Mediterranean sea, and are usually navigated by Italians, Greeks, or Mahometans.

SETTEFRATRI, in *Geography*, a town of Naples, in Abruzzo Ultra, 10 miles N. E. of Teremo.

SETTENIL, a town of Spain, in the province of Grenada; 8 miles N. of Ronda.

SETTER, among *Farmers*. To *settle*, is to cut the dew-lap of an ox, or cow, and into the wound to put the root of the hellebore; by which an issue is made, for ill humours to vent themselves.

SETTER-Wort, in *Botany*. See HELLEBORE.

SETTIA, in *Geography*, a province of the island of Candia, occupying the whole eastern part of the island; it is the most extensive, but the least peopled, and the least productive,

productive, though in a great measure susceptible of culture, and though most of its lands are very fertile. But distance from the capital, want of harbours, and the inconsiderate injustice of the agas, and almost every other circumstance, contribute to render the inhabitants of this part of the island more indolent than the others. Contented with gathering corn and fruit for their subsistence, oil for paying their taxes, and procuring for themselves a few clothes, and the utensils necessary for their family, they are not eager to seize from the earth a surplus of productions, which would render them more subject to the oppression and spoliation of the agas. The town is situated on a flat shore, which with a cape not much advanced, and three islets placed at upwards of a league's distance, protect it feebly from the N. and N.E. winds. When the Venetians were masters of the island, it was tolerably well fortified, and sufficiently peopled. They constructed a mole, in order to shelter the vessels which came thither to load with the productions of the province, or which brought those that were necessary to supply the wants of the inhabitants. At this day none but small boats may be seen at Settia. The population has diminished considerably, and the fortifications are in the greatest disorder. It is the see of a Greek bishop; 44 miles E.S.E. of Candia. N. lat. $35^{\circ} 3'$. E. long. $26^{\circ} 3'$.

SETTIAVERAM, a town of Hindoostan, in the circle of Cicacole; 30 miles S.W. of Cossimcotta.

SETTIMA, Ital., in *Music*, the interval of the *seventh*; which see.

SETTIMANA SANTA, Ital., passion-week, during which holy time, the sacred music of the highest class used to be performed in the most perfect and impressive manner in the pontifical chapel. See MISERERE and ALLEGRI.

SETTIMO, in *Geography*, a town of France, in the department of the Po; 8 miles N. of Turin.—Also, a town of Italy, in the department of the Tesino; 5 miles N.N.E. of Pavia.

SETTING, in *Astronomy*, the withdrawing of a star or planet; or its sinking below the horizon.

Astronomers and poets make three different kinds of setting of the stars: cosmical, acronichal, and heliacal.

To find the times of the setting of the sun and stars, see GLOBE.

SETTING, in *Seamanship*. To set the land, or the sun, by the compass, is to observe how the land bears on any point of the compass, or on what point of the compass the sun is; likewise the act of observing the situation of any distant object by the compass, in order to discover the angle which it makes with the nearest meridian: as at seven *post* meridian, we set the tower of Arabia near the port of Alexandria, and it bore S.S.E. distant four leagues by estimation. (See BEARING.) Also, when two ships sail in sight of one another, to mark on what point the chased bears, is termed *setting the chase by the compass*.

SETTING also denotes the direction of the wind, current, or sea, but particularly the two latter; as, the tide, which sets to the south, is opposed to a swelling sea, setting to the north-west.

SETTING, when applied to the sails, is the loosening and expanding them, so as to give the ship motion, or to accelerate her velocity, when she is already moving, and perhaps give a new direction to her motion. It is used in contradistinction to taking-in the sails, as loosening or heaving-out is opposed to furling or stowing them.

SETTING, in the language of *Sportsmen*, a term used to express a manner of attacking partridges, in order to the taking of them by means of a dog peculiarly

trained to that purpose. The setting-dog generally used is a long land-spaniel, taught by nature to hunt partridges more than any other game, and in his untaught state running over the fields in search of them, with an alacrity that is truly wonderful; yet by art this creature is brought under such excellent command, that he will, in the midst of his highest career, attend to the least hem from his master, and stand still to look in his face, and take his orders by the slightest signals; and when he is so near his game, that it is almost in his mouth, he will stand still, or lie down on his belly till his master arrive, and he receives his directions.

The setting-dog being taken to the haunt of the partridges is to be cast off, and sent to range; but he must be made to keep near the sportsman, and not to run wildly on, but to beat all the ground regularly. On being reproved for ranging too widely and too far, he will keep close the whole day, and at times look up in his master's face, to know if he does right or wrong. If in the dog's ranging he stop of a sudden, the sportsman is to make up to him, and as there is certainly game before him, he must be ordered to advance; if he refuses this and look back and shake his tail, it is a signal that they are close before him, and the sportsman is then to take a circumference, and look with a careless eye before the dog's nose to see where they are, and how they lie; then going up, and flaking down one end of the net, he is to command the dog to lie still, and to draw the net gently over the birds; then making in with a noise, he is to spring them, and they will be entangled and taken as they rise. It is a rule with fair sportsmen, when they take a covey in this manner, always to let the cock and hen go.

SETTING, among *Cock-Masters*, is the placing a cock that has fought so that he cannot stand, beak to beak against the other cock, and if he does not strike, the battle is won.

SETTING-down, in *Falconry*, is when a hawk is put into mew.

SETTING-dog, one trained up to find out and discover to the sportsman whereabouts fowls are. See SPANIEL and DOG.

SETTING-up, in *Ship-Building*, is raising a ship by shores and wedges from her blocks, the act of extending the shrouds, stays, and back-stays, to secure the masts, by the application of tackles, &c.

SETTING, or *Setting-to*, the act of making the planks, &c. lay or set close to the timbers, by driving wedges between the plank, &c. and wain-staff. Hence "set, or set away," means to exert more strength. The power or engine used for this purpose is simple, and called a *sett*, and is composed of two ring-bolts, and a wain-staff, cleats and lashing, or shores.

SETTING, in *Agriculture and Gardening*, the business of putting sets of different kinds into the ground, as those of the potatoe, hop, madder, liquorice, lavender, and many other kinds.

SETTING out *Plants*, the practice of thinning and reducing them; in the former, to their proper distances, in order to stand for crops, as in the turnip, cabbage, and many other sorts of plants; and, in the latter, the business of putting them into the ground as crops; it being practised for a great many different sorts of plants that are raised on seed-beds, as all the cabbage kind, lettuces, endives, beets, and many other plants of a similar nature. It is usually performed as soon as the plants have acquired a proper state of growth in the seed-beds, and mostly when the weather is cloudy and rather moist, as it can then be done to the greatest

greatest advantage, in so far as the plants are concerned. They are commonly put out in this way to the proper distances for growing as crops, and the work is for the most part done by means of a line and dibble. See *THINNING out Crops*, and *TRANSPLANTING*.

SETTING of Wheat, is a method of cultivating wheat, which was probably first suggested by planting grains in a garden from mere curiosity, and first attempted on a larger scale by a farmer near Norwich, about the year 1768. His example was followed by some of his neighbours, and particularly by one of the largest occupiers of land in the county of Norfolk, who set fifty-seven acres in one year. His success, from the visible superiority in his crop both in quantity and quality, was so great, that the following autumn he set three hundred acres, and afterwards continued the practice. The method of setting was generally introduced, in consequence of this experiment, among the intelligent farmers, in a very large district of land. And it has been observed, in recommendation of it, that, although the set crops appear very thin during the autumn and winter, the plants tiller and spread prodigiously in the spring. The ears are indisputably larger, without any dwarfish or small corn; the grain is of a larger fathom, and specifically heavier *per bushel* than when sown. It furnishes employment for aged persons and children, at a season when they have little else to do; it saves to the farmer six pecks of seed-wheat in every acre; the expence is already reduced to about six shillings an acre; and a drill-plough has been invented, by which one man may set an acre a day.

The lands on which this method particularly succeeds, are either after a clover stubble, or those on which trefoil and grafs-feed were sown the spring before the last, and on which cattle have occasionally pastured during the summer. These grounds, after the usual manuring, are once turned over by the plough in an extended flag or turf, at ten inches wide; along which a man, who is called a dibbler, with two setting-irons, somewhat bigger than ram-rods, but considerably bigger at the lower end, and pointed at the extremity, steps backwards along the turf, and makes the holes about four inches asunder every way, and an inch deep. Into these holes, the droppers (women and children) drop two grains, which are quite sufficient. After this, a gate, bushed with thorns, is drawn by one horse over the land, and closes up the holes. By this mode, three pecks of grain are sufficient for an acre; and being immediately buried, it is equally removed from vermin, or the power of frost. The regularity of its rising affords the best opportunity of keeping clear from weeds, by weeding or hand-hoeing.

SETTING, a term used in sheep-management, which signifies the picking, choosing, and selecting those which are the best formed, and most perfect for the purposes of breeding, forming the flock, and keeping as stock; the others, or the refuse ill-formed sheep, being fold off, or sent to be fattened in the proper pastures. The practice is extremely useful and necessary, where good stock of this kind is aimed at, as it cannot be well obtained without it. See *SHEEP*, and *SORTING Sheep-Stock*.

SETTING Lamb-Stock, a term made use of to signify the practice of culling and removing those lambs, which are any way improper for being kept as stock. It is an excellent custom in sheep-management, which should be as seldom as possible neglected.

SETTING of Farms, the business of letting them to tenants of different kinds. Much care and attention are necessary in the management of this business. See *LETTING Farms*.

SETTING of Bricks. See *BRICKS*.

SETTING-Pin, the name of a dibble or setting-tool.

SETTING-Stick, the stick used in setting out plants or cuttings as field crops, and in putting in and planting out those used for garden culture.

SETTLE, in *Geography*, a market-town in the parish of Giggleswick, west division of the wapentake of Staincliffe and Ewicrofs, West Riding of Yorkshire, is situated at the distance of 58 miles W. by N. from York, and 232 miles N.W. by N. from London. The position of this town, though singular, is pleasant, standing close to the base of an almost perpendicular lime-stone rock, about 300 feet high; from the summit of which is a fine prospect of an expansive vale, bounded on all sides by craggy mountains. This vale, which is watered by the river Ribble, and hence has acquired the appellation of Ribblesdale, is not surpassed by any in England in richness of verdure. As the prevalence of fogs and rains prevents the ripening of corn, it is almost wholly appropriated to pasturage; and such is its fertility, that the greater part of it rents as high as six pounds an acre. According to the parliamentary returns of 1811, Settle township contains 274 houses, and 1153 inhabitants, who are chiefly engaged in the cotton manufacture, and in the pursuits of husbandry. Like most of the other towns and villages in this district, it is principally built of stone, brick being used only for the chimnies. The market day here is Friday, weekly; and the fairs are on Tuesday before Palm Sunday, Thursday before Good Friday, and every alternate Friday till Whit Sunday, 26th April, 2d June, 18th and 21st August, first Tuesday after 27th October, and every other Monday throughout the year. These fairs are generally well attended, and are noted for large supplies of cattle.

About a mile to the N.W. of Settle is the village of Giggleswick, which gives name to the parish, and where the church is accordingly situated. This village is remarkable for an excellent free grammar-school, founded in the reign of Edward VI., and supported by rich endowments in land. At present the salary of the master is 500*l.* *per annum*, that of the usher 200*l.*, and that of the writing-master 150*l.*; and each has a good house, garden, and every convenience for a comfortable dwelling. Near Giggleswick is a spring, which exhibits the singular phenomenon of a constant influx and reflux of its waters at irregular periods, sometimes thrice or oftener in an hour. No satisfactory explanation of this singularity has yet been offered to public notice.

At the distance of several miles further to the N.W. from Settle, on the road to Kendle in Westmoreland, stands Ingletton, a large village, the vicinity of which presents many objects worthy the attention of the admirers of romantic scenery. Among these are Thornton-Scar, Yordas Cave, and Weathercote Cave, and the mountains of Ingleborough, Pennigant, and Wharfedale. Thornton-Scar is a tremendous chasm, above 300 feet in depth, which extends a considerable way into the mountains, and is so narrow towards the bottom, that the sides in some places approach within a few feet of each other. Yordas Cave is situated under a mountain, called Greg-roof. It is entered through a rude arched opening, resembling the gateway of an ancient castle, and extends about 170 feet in length, 40 in breadth, and 48 in height. On one side are several recesses, and the roof and walls exhibit a variety of petrifications. Weathercote Cave displays scenery still more romantic and sublime. It is of a lozenge form, and divided into two by a grotesque arch of lime-stone rock; the total length about 200, and the breadth about 90 feet. At the south

fourth end is an entrance down into a small cave, which communicates with the larger one by a subterraneous passage, "where the astonished visitant sees, issuing from a large aperture in the rock, an immense cataract, falling above 20 yards in an unbroken sheet, with a noise that stuns the ear. The water disappears as it falls from the rocks and pebbles, and runs about a mile under ground. The whole cave is filled with the spray that arises from the cataract, and sometimes a small vivid rainbow appears, which for colour, size, and situation, is scarcely any where else to be equalled."

But the most sublime features of this romantic district are the mountains of Ingleborough, Pennigant, and Wharfedale. The summit of Ingleborough is level and horizontal, and, from its great elevation, commands extensive prospects on all sides. To the east, the picturesque country of Craven presents a confused assemblage of hills, gradually diminishing in height till they vanish in the horizon. Pennigant, at the distance of four miles, appears to be almost within a leap; as do also the rocks of Settle and Pendlehill. The northern and north-western prospect exhibits a mass of mountains. Wharfedale is within the distance of six miles, and Snowdon and Crowsell are clearly visible in the back ground. Towards the west the flat country of Lancashire lies as in a map, and the prospect extends far into the Irish sea, the nearest point of which is 24 miles from Ingleborough. *Beauties of England and Wales*, vol. xvi. by John Bigland, 8vo. 1813.

SETTLEMENT, *Act of*, in *British History*, a name given to the statute 12 & 13 W. III. cap. 2. by which the crown was limited to his present majesty's illustrious house; and some new provisions were added, at the same fortunate era, for better securing our religion, laws, and liberties; which the statute declares to be the birth-right of the people of England, according to the ancient doctrine of the common law. See *Right of Crown*.

SETTLEMENT, *Marriage*. See **MARRIAGE**.

SETTLEMENT *of the Poor*. See **POOR**.

SETTLING *a Deck, at Sea*, a term for taking a deck lower than it was at first.

SETTLING *the Land*, denotes sinking it lower, by sailing farther out to seaward, and is used in the same sense with *laying the land*.

SETTOREE, in *Geography*, a town of Bengal; 56 miles N.W. of Burdwan.

SETTOVITONE, a town of France, in the department of the Dora; 4 miles N. of Ivrea.

SETTS, powers made use of, where force is required, to bring or unite two or more pieces together. The operation is performed by screws, shores, cross-sets, or cleets.

SETTS, *Cross*, are made by two short pieces of spars, about four or six feet in length: one is laid across on the upper side, and the other on the under side, of any two pieces that are to be brought together, and their ends lashed together on each side with several turns of rope, taken round each end alternately: wedges are then driven in between the upper cross-piece, and the side or part of the mast.

SETTS *for Saws*, instruments for setting their teeth, when out of order.

SETUNA, in *Geography*, a town of Africa, on the Grain Coast.

SETUVAL, or *St. Ubes*, a strong sea-port town of Portugal, in the province of Estremadura, situated in a bay of the Atlantic, at the mouth of the river Sandao, with a good harbour, capable of receiving any ships of burden. This town was founded on the ruins of the ancient Cedo-

briga, which was destroyed by the Moors. The environs abound in corn, wine, and oil. Besides the old walls and towers, it is strengthened with eleven whole and two demi-bastions, with several other out-works. It has likewise a strong citadel, called "St. Philip," in which is a spring of excellent water; and the strong fort of Outao, near the harbour, which also serves for a light-house, exclusive of which it has two smaller forts. It contains four churches, two hospitals, ten convents, an academia problematica, founded by John V., and about 10,000 souls. In 1796, the number of vessels which entered this harbour was 558; and the same number sailed from it; 15 miles S.S.E. of Lisbon. N. lat. 38° 29'. E. long. 8° 53'.

SETWELL, in *Botany*, a name sometimes used for a species of valerian.

SETZINI, in *Geography*, a town of Poland, in the palatinate of Sandomirz: near it are some silver mines, and some lapis-lazuli; 16 miles W. of Malogocz.

SEV, a river of Russia, which runs into the Desna, near Trubchevsk, in the government of Orlov.

SEU, a river of Malacca, which runs into the Chinese sea, N. lat. 6° 45'. E. long. 10° 19'.

SEVAJEE, in *Biography*, a distinguished person in the history of Hindoostan, the founder of the modern Mahratta empire, was the son of Shawjee, who, from an humble situation, had raised himself by his talents to be guardian to a minor of the house of Nizam Shah. On a Mogul invasion of the country, being closely pursued by the troops of his father-in-law, Jadoo Row, with whom he was at enmity, Shawjee escaped with an infant son, and left his pregnant wife to fall into the hands of her father. She was kindly received, and was delivered of her second son, Sevajee, the subject of this article, in the month of May 1626, and finally separated from her husband.

Sevajee, at the age of 17, placed himself at the head of a body of banditti, who pillaged all the neighbouring districts, which so affected the person who had been entrusted with the care of his education, that he put an end to his life. Upon this, Sevajee took possession of the property accumulated from his father's estate, and increased the number of his followers, so as to become a most formidable free-booter. His exploits soon rendered him dangerous to the government of Visapour, which sent a powerful army against him, and brought him to submission. Sevajee asked pardon for his offences, and, by the humility of his deportment, threw the general, sent against him, off his guard, till he found an opportunity to stab him to the heart with a concealed dagger: in consequence of which the army dispersed. Shawjee, the father of this desperate young man, was now high in office at Visapour, and though he pretended entirely to have renounced his son, a correspondence between them was suspected, and a plan was formed for seizing his person, and putting him to death. He was, however, saved by the intercession of a patron, and at length restored to office. But he was resolved to have ample revenge for the affront, and caused Sevajee to murder the chief who had seized him, and his whole family. After this Shawjee paid a visit to his son at Poona in great state, and manifested much affection and respect for him.

Sevajee now proceeded in a career of successful predatory war, and in 1664 pillaged the rich city of Surat. Having, in 1672, laid the king of Golconda under a heavy contribution, he afterwards entered into an alliance with a potentate against the Mogul and the king of Visapour, the object of which was the expulsion of all the Mahometan powers from the Deccan; and marching with a great army, in 1677, towards Golconda, he took possession of many fortresses,

fortresses, and pillaged the whole country. His half-brother, Eccojee, was now king of Tanjore; and the different branches of the family were possessed of a large portion of the south of India.

The principal dominions of Sevajee were in the tract called Concan, extending from the south of Surat to the south of Goa, which rendered him completely master of the western Gauts; from which he was, at all times, able to issue and ravage the plain country, while it was impossible to force him from his fastnesses: hence he was denominated by Aurungzebe the mountain rat. Sevajee continued this course of action till his death in 1680, when he was succeeded in his conquests by his son Sambajee.

SEVANI, in *Geography*, a town of Persian Armenia, on a lake; 40 miles E. of Erivan.

SEVASTOPOL, a sea-port town of Russia, in the province of Tauris, on the coast of the Black sea, with an excellent harbour for men of war; 80 miles S. of Pereltop. N. lat. $44^{\circ} 45'$. E. long. $33^{\circ} 24'$.

SEUBELSDORF, a town of Germany, in the principality of Culmbach; 6 miles N. of Culmbach.

SEUBITZ, a town of Germany, in the principality of Culmbach; 8 miles S.S.E. of Bayreuth.

SEUCKENDORF, a town of Germany, in the margravate of Anspach; 4 miles E. of Längenzen.

SEUDRE, a river of France, which runs into the sea, opposite the isle of Oleron. N. lat. $45^{\circ} 49'$. W. long. $1^{\circ} 5'$.

SEVE, a town of France, in the department of the Seine and Oise, celebrated for its manufacture of china; $1\frac{1}{2}$ post S.W. of Paris.

SEVEKTEN, or SEVEKOTE, a town of France, in the department of the Lys; 10 miles S.W. of Bruges.

SEVEN, a river of Yorkshire, which runs into the Derwent.

SEVEN AGES, rocks in the Caribbean sea, near the S.E. coast of the island of Blanca.

SEVEN BROTHERS, a cluster of small islands near the north coast of Hispaniola. N. lat. $19^{\circ} 53'$. W. long. $72^{\circ} 35'$.

SEVEN CAPES. See *SEBBA Rous*.

SEVEN HEADS, a promontory of the county of Cork, Ireland, west of Courtmarsherry bay, and 6 miles W.S.W. of the old head of Kinfale. N. lat. $51^{\circ} 34'$. W. long. $8^{\circ} 41'$.

SEVEN ISLANDS, a cluster of small islands in the East Indian sea. S. lat. $1^{\circ} 9'$. E. long. $105^{\circ} 21'$.

SEVEN ISLANDS, a cluster of islands near the west coast of Sumatra, lying off Padang.

SEVEN ISLANDS, a cluster of small islands in the English Channel, near the coast of France. N. lat. $48^{\circ} 54'$. W. long. $3^{\circ} 23'$.

SEVEN ISLANDS, a republic so named, lately formed by the union of the islands of Zante, Cephalonia, Corfu, Cerigo, Curzola, St. Maura or Leucadia, and Teaki, constituted about the year 1799, acknowledged by the Ottoman Porte, and by the French and Great Britain, at the peace of Amiens, 1802.

SEVEN ISLANDS, small islands of Virginia, in James river. N. lat. $37^{\circ} 40'$. W. long. $78^{\circ} 32'$.

SEVEN ISLANDS, a cluster of small islands near the coast of Canada, in the gulf of St. Lawrence. N. lat. $50^{\circ} 10'$. W. long. $66^{\circ} 5'$.

SEVEN ISLANDS' BAY, a bay of Canada, on the north side of the river St. Lawrence. N. lat. $50^{\circ} 5'$. W. long. $66^{\circ} 25'$.

SEVEN PAGODAS, a town of Hindoostan, in the Carnatic; 30 miles S. of Madras.

SEVEN ROCKS' POINT, a cape in the English Channel, on the coast of Dorsetshire; 3 miles S.W. of Lyme Regis.

SEVENAER, or ZEVENAER, a town of Germany, in the duchy of Cleves; 10 miles N. of Cleves.

SEVENBERGEN, a town of Dutch Brabant; 8 miles N.W. of Breda.

SEVENNES, or CEVENNES, mountains of France, crossing the department of the Lozere, particularly memorable as being the strong hold of the Protestants in the 17th century, and beginning of the 18th.

SEVENOAKS, or SEVENOKE, a market-town, in a parish of the same name, hundred of Codsheath, lathe of Sutton at Hone, and county of Kent, England, is situated on high ground at the distance of 16 miles W. by N. from Maidstone, and 33 miles S.E. from London. In the *Textus Roffensis* the name is written *Seauanacca*, and is said to have been suggested by the circumstance of a cluster of seven large oaks growing on the site of the town, at the time of its foundation. The principal building here is the church, which forms a conspicuous object for several miles round the country. It formerly contained a chantry chapel, founded by sir Henry Gawdy, who was buried within it. The only monument of note is that of William Lambarde, the celebrated Kentish antiquary, whose family had a seat in this parish. Here are an alms-house and free-school, originally built and endowed by sir William de Sevenoke, in the beginning of the 15th century. They were subsequently incorporated under the title of the free grammar-school of queen Elizabeth, and now possess a revenue of nearly 1000*l.* a-year. The school-house was rebuilt in 1727, at which time the alms-house was substantially repaired. The former has six exhibitions to either university, and the latter affords an asylum to thirty-two elderly trades-people, who have a weekly allowance in money. This town consists chiefly of two wide streets, in one of which stands the ancient market-house, where the assizes were frequently held during the reign of queen Elizabeth, and where the petty sessions for the lathe of Sutton at Hone are still held. Many of the houses are large and respectable mansions, inhabited by independent families. The market-day here is Saturday, weekly; and there are two annual fairs on the 10th of July and the 22d of October. Seven-oaks town and parish constitute a liberty, governed by a warden or bailiff and four assistants, who are not, however, empowered to hold any court of record for pleas. According to the parliamentary returns of 1811, this liberty contains 638 houses and 3444 inhabitants, of whom about 1500 reside in the town. History and Topographical Survey of Kent, by Edward Hasted, 8vo. 1797, vol. iii. Beauties of England and Wales, vol. viii. by E. W. Brayley, 8vo. 1805.

SEVENTH, SEPTIMA, in *Music*, an interval, called by the Greeks *heptachordon*; of which there are four kinds.

The first, the *defective* or *diminished* seventh, consisting of three tones, and three greater semitones, as from *ut* sharp to *fi* flat: its ratio is 128 to 75.

The second, called by Zarlini, and the Italians, *semitono con diapente*, or *settimo minore*, is composed diatonically of seven degrees, and six intervals, four of which are tones, and the rest greater semitones, as from *de* to *ut*; and chromatically of ten semitones, six of which are greater, and four less: it takes its form from the ratio *quadrupartiens quintas*, 9 to 5.

The third, called by the Italians *il ditono con diapente*, or *settimo*

settimo maggiore, is composed diatonically, like the former, of seven degrees, and six intervals, six of which are full tones, and a single one a greater semitone; so that only one greater semitone is wanting of the octave; as from *ut* to *fi*: and chromatically of eleven semitones, six of which are greater, and five lesser. It takes its origin from the ratio of 15 to 8.

The fourth is the *redundant* seventh, composed of five tones, a greater semitone and a lesser, as from *fi* flat to *la* sharp: so that it only wants a comma of an octave; that is, so much as it wants to render its second semitone a greater. Hence many confound it with the octave itself; maintaining, with good reason, that only the three first sevenths can be of any use.

In thorough basses the seventh, whether double, simple, major, or minor, is marked by a figure of 7; but if it be accidentally flat, or minor, thus, *b* 7, or 7 *b*. If sharp, major, thus, * 7, or 7 *. Again, if when it is naturally minor, it be marked with a flat, it must be diminished. See FUNDAMENTAL.

SEVERAC *le Chateau*, in *Geography*, a town of France, in the department of the Aveyron, and chief place of a canton, in the district of Milhau; 21 miles E. of Rodés. The place contains 2113, and the canton 6051 inhabitants, on a territory of 212½ kilometres, in 7 communes. N. lat. 46° 19'. E. long. 3° 9'.

SEVERAL, in *Agriculture*, the same as *dole*. See DOLE.

SEVERAL *Tail*, or *Inheritance*, in *Law*. See INHERITANCE.

SEVERAL *Tenancy*, *Tenura separalis*, a plea, or exception taken to a writ that is laid against two persons as joint tenants, who are *several*.

SEVERALTY, *Estates in*. He that holds lands or tenements in severalty, or is sole tenant of them, is he who holds them in his own right only, without any other person being connected with him in point of interest, during his estate therein.

SEVERALTY *Land*, in *Agriculture*, such as is in an open field state, and divided amongst many. It is a bad situation or tenure of land, and ought to be done away as soon as possible.

SEVERANCE, in *Law*, the *singling* or *severing* two or more that join, or are joined, in the same writ or action.

As if two join in a writ, *de libertate probanda*, and the one be afterwards nonsuited; here severance is permitted, so as, notwithstanding the nonsuit of the one, the other may severally proceed.

There is also *severance of the tenants* in assise; when one, two, or more disseisees appear upon the writ, and not the other. And *severance in debt*, where two executors are named plaintiffs, and the one refuses to prosecute. We also meet with *severance of summons*, *severance in attaints*, &c.

An estate in joint tenancy may be severed and destroyed by destroying any of its unities. 1. That of time, which respects only the original commencement of the joint estate, cannot indeed (being now past) be affected by any subsequent transaction. But, 2. The joint-tenant's estate may be destroyed, without any alienation, by merely disuniting their possession. 3. The jointure may be destroyed, by destroying the unity of title. And 4. By destroying the unity of interest. Blackst. Comm. book ii.

SEVERANCE of *Corn*. The cutting and carrying it from

off the ground; and sometimes the setting out the tythes from the rest of the corn, is called severance.

SEVERIA, or SIEWEIRZ, in *Geography*, a town of Austrian Poland, in Galicia, capital of a duchy sold by the duke of Teschen to the bishops of Cracow; 4 miles N.W. of Cracow.

SEVERIA, a town of European Turkey, in the Morea; 14 miles N.E. of Mistra.

SEVERIANS, SEVERIANI, in *Ecclesiastical History*. There were two sects of heretics thus called: the first, who are as old as the beginning of the third century, were an impure branch of the Gnostics; thus called from their chief, Severus.

The second, by some called Severites, were a sect of Monophysites, or Eutychians; their leader, Severus, was preferred to the see of Antioch in 513, where he did his utmost to set aside the council of Chalcedon.

SEVERIK, in *Geography*, a town of Asiatic Turkey, in the government of Diarbekir; 50 miles W. of Diarbekir.

SEVERIN, or SZÖRENY, a town of Walachia, on the Danube, founded by the emperor Severus; 12 miles E. of Orfova.

SEVERINUS, pope, in *Biography*, a Roman, was elected soon after the death of Honorius, in 638, but was not consecrated till May 640, when the papal see had been vacant nearly two years. This delay was owing to the refusal of the emperor to confirm the election till the clergy of Rome had promised that their bishop should sign the declaration of faith relative to the one will of Christ, drawn up by Sergius, the patriarch of Constantinople, and published by Heraclius. During the vacancy of the see, the Lateran palace was plundered of all its treasures by the exarch of Ravenna. At length the confirmation of the election of Severinus arrived, but he enjoyed his elevation only about two months, which afforded opportunity for no remarkable act, except that he refused to receive the declaration, and even published a decree condemning it.

SEVERINUS, MARCUS AURELIUS, a distinguished physician, was born at Tarsia, in Calabria, in the year 1586. His early inclination led him to the study of the law; but he subsequently abandoned that pursuit for the profession of medicine, and received the degree of doctor in the university of Naples. He became ultimately one of the most celebrated professors of that school, and taught anatomy and surgery with such reputation, as to attract a crowd of students to the university. His method of treating surgical subjects in his writings was highly commended by Bartholin. He was, however, a harsh practitioner, and censured the inertness of his contemporaries, for neglecting the cautery and the knife, as employed by the ancients, and himself carried the use of the actual cautery to a great extent. He died at Naples, on the 15th of July, 1656, at the age of seventy-six. He was a man of bold and original mind, but somewhat attached to paradox; and was the author of several publications, of which we have the following catalogue. "Historia Anatomica, Observatioque medica viscerati hominis;" 1629. "De recondita abscessuum natura Libri octo;" 1630, which passed through many editions. "Viperæ Pythiæ, id est, de Viperæ natura, veneno, et medicina;" 1643. "Zootonica Democritea, id est, Anatomie generalis totius animalium opificii, Lib. v." 1645, containing the result of his dissection of a great many animals. "De efficaci Medicina, Libri iii." 1646. In this work he extols the advantages of fire and steel in the cure of diseases. "De Lapide fungifero, de Lapide fungimappa, Epistolæ duæ;" Y y 1649.

1649. "Therapeuta Neapolitanus, five curandarum Februm et Morborum internorum Methodus;" 1653. "Trimembris Chirurgia;" 1653. "Seilo-Phlebotome castigata, five de Venæ Salvatellæ usu et abusu censura;" 1654. "De Aqua Pericardii, cordis adipe, poris choledocis;" 1654. At the time of his death, Severini was preparing for publication some papers, which he meant to illustrate by engravings; they were published together, and entitled, "Antiperipatias, hoc est, adversus Aristoteles de respiratione piscium Diatriba." "Commentarius, in Theophrastum de piscibus in sicco viventibus." "Phoca anatomicæ spectatus;" 1661. A sort of extract or abridgment of his writings on surgery was also published in 1664, with the title of "Synopsis Chirurgicæ Libri vi." See Eloy Dict. Hist.

SEVERN, in *Geography*, the second most important river in England, is supposed by some antiquaries to derive its name from the British word *fabrin*, sandy, or muddy; but others, with greater probability, consider it as a corruption of the Saxon term *seferne*, which signifies sea-flowing. This river has its source from a large bog on the top of Plinlimmon-hill, in Montgomeryshire, North Wales, whence running down with a swift current, and being joined by many lesser torrents, it presently appears considerable; and passing by Llanydlos and Newtown, becomes navigable near Welsh-Pool, where the river Vernew joins it with a stream little inferior to its own. From thence proceeding gently to Shrewsbury, which it almost surrounds, it flows on through a rich vale, with many extensive windings, to Benthall Edge; by the way receiving into it the river Tern, which waters all the north of Shropshire. Here the Severn begins to be rapid, being pent up from thence, to Bridgenorth and Bewdley, by high woody banks and rocky cliffs, which afford a variety of beautiful prospects. Afterwards it again glides pleasantly on through the fertile plains of Worcester-shire, visiting in its course the city of Worcester itself, near which it receives the waters of the Teme. At Tewkesbury it forms a junction with the Avon, and thereafter pursues its course to Gloucester, about fifty miles below which city the name of Severn is lost in that of the Bristol channel.

The Severn is a river of great importance, being navigated by vessels of large burthen for more than 160 miles from its mouth, without the assistance of any lock. Upwards of 100,000 tons of coal are annually shipped by the collieries about Madeley and Broseley, for the cities and towns situated on its banks, and thence conveyed into the adjacent counties. Great quantities of grain, pig and bar iron, iron manufactures, and earthen-ware, as also wool, hops, cider and provisions, are likewise sent to Bristol and other places, whence various kinds of goods are brought in return. This traffic is carried on with vessels of two sorts, the larger ones being called trows, and the lesser ones barges, or frigates. In May 1756, the number of these vessels navigating from Welsh-Pool, in Montgomeryshire, to Bristol, amounted to 376; but in consequence of the addition of the inland canals from the Trent, the Mersey, and the Thames, into the Stroud navigation, it may be fairly calculated that more than double that number are now employed. This river is peculiarly remarkable for its tide, which rolls in with a head of three or four feet high, foaming and roaring in its course, as if enraged by the opposition it meets with from the strong descending current of fresh water, which seems to contend with it for the superiority. They clash in such a manner as to dash the waters to a considerable height. This contest is called the *hygre*, or *eager*, as Rudder sup-

poses, from the French *eau-guerre*, i. e. water-war. Drayton, in his *Poly-Albion*, describes it in these words.

———"With whose tumultuous waves,
Shut up in narrow bounds, the Hygre wildly raves,
And 'frights the straggling flocks, the neighbouring shore
to fly
Afar, as from the main it comes with hideous cry,
And on the angry front the hideous foam doth bring.
The billows 'gainst the banks when fiercely it doth fling,
Hurles up the slimy ooze, and makes the scaly brood
Leap madding to the land, affrighted from the flood;
O'erturns the toiling barge, whose steersman doth not
launch,
And thrusts the furrowing beake into her ireful paunch."

Rudder, in his "History of Gloucestershire," remarks that the bailiwick of the Severn is vested in the crown; that John Arnold obtained a lease of it in 1669 for 31 years, at 10*l.* a-year, and that the bailiff in 1779 was a Mr. Edward Baylis. From the rapid and boisterous character of this river, its waters are extremely muddy, a circumstance which renders it unfavourable as an abode for fish. It is, however, well furnished with salmon in some of the calmer spots, and is particularly famous for lampreys. For an account of the local circumstances of this river, and the scenery on its banks, see the articles MONTGOMERYSHIRE, SHROPSHIRE, WORCESTERSHIRE, and GLOUCESTERSHIRE, also WELSH-POOL, SHREWSBURY, and WORCESTER. Skrine's *History of Rivers*, 8vo. Atkyns's *Ancient and present State of Gloucestershire*, folio, 1768. Rudder's *New History of Gloucestershire*, fol. 1779. Fosbrooke's *Abstracts of Records and Manuscripts respecting the County of Gloucester*, 4to. 1807. Nash's *History of Worcester-shire*, fol. 1782. Also *Tours in Wales* by Pennant, Bingley, Hutton, Skrine, Warner, and Wyndham.

SEVERN, a river of America, in Maryland, which runs into the Chesapeake, a little below Annapolis.—Also, a river of North America, which runs into Hudson's bay, with a settlement at its mouth, called "Severn House." N. lat. 56°. W. long. 88°.—Also, a river of North America, which runs from lake Simcoe to lake Huron.—Also, a river of Virginia, which runs into the Chesapeake bay, N. lat. 37° 23'. W. long. 76° 27'.

SEVERNDRÖÖG, a sea-port town and fortress of Hindoostan, in Concan, taken by the English in 1756; 68 miles S. of Bombay. N. lat. 17° 55'. E. long. 72° 50'.

SEVERUS, LUCIUS-SEPTIMIUS, in *Biography*, a Roman emperor, was born at Leptis, in Africa, in the year 146 of the Christian era. His father, Septimius Geta, was of a Roman equestrian family, and his two paternal uncles were raised to the consular dignity. Severus was liberally educated, and made a proficiency in rhetorical studies. He came to Rome in the reign of Marcus Aurelius, by whom he was raised to the offices of advocate of the treasury, and senator. His youth was licentious; he however passed with credit through the offices of quaestor, tribune of the people, and prætor, in consequence of his active and regular performance of his public duties. After his quaestorship, he went into Africa, as lieutenant of the proconsul, where he shewed his sense of the dignity of office, and the importance of strict discipline, by causing an old acquaintance of ordinary rank to be scourged for greeting him familiarly, as he was walking, preceded by lictors. After he had completed the prætorian year, he was sent to Spain with the command of a legion. He passed some time in retirement at Athens, at the beginning of the reign of Commodus; after this, however, he was raised

SEVERUS.

raised to the highest honours, being successively appointed governor of the district of Lyons, consul, and commander of the legions posted on the banks of the Danube.

At the death of Commodus, Severus acquiesced in the elevation of Pertinax to the throne; but when, after the murder of that prince, the empire was purchased by Didius Julianus, he procured himself to be declared emperor by his Pannonian legions, in the year 193. Sensible that nothing was so essential to his success as celerity, after preparing his troops, he immediately commenced his march, which he performed on foot, at the head of a select body of guards, sharing with the meanest foldier all the hardships of his rapid advance. He entered Italy without meeting with any resistance, Julianus being incapable of any consistent and effective measures. On his approach to Rome, his competitor was deposed and put to death, and Severus received the decree of his election to the empire. His first act of power was to inflict a just punishment on those of the prætorian guards who were immediately concerned in the murder of Pertinax, which was the only blood that his elevation hitherto cost. Though he spared the lives of that mutinous and dissolute body, he determined to disband them, and with this view he summoned them on a plain near the city, ordering them to come without arms. He now reproached them for their want of discipline, stripped them of their ornaments, and ordered them, on pain of instant death, to depart to the distance of one hundred miles from the capital. Severus was not secure on his throne, having to contend with two formidable rivals, Pescennius Niger, governor of Syria, and Clodius Albinus, commander in Britain. Niger being the more powerful, Severus made the first attack upon him; and in the mean time, to secure himself against the attacks of Albinus, he flattered his vanity, conferring upon him the title of Cæsar; and in a letter conceived in terms of apparent respect and friendship, he requested him to partake with himself the toils of government, which age and infirmity rendered him unable to undergo without an associate. In this manner he disarmed the unsuspecting foldier. Severus now marched out to encounter Niger, whom he defeated in several battles, of which the last was at Issus, in Cilicia. Severus was now freed from further contest by the death of his rival, who was slain in his flight to the Euphrates, but he used his victory with great rigour; he banished and afterwards put to death the sons of Niger, severely fined all the towns which had taken his part, and executed all the senators who had been officers in his army. Taking Byzantium after a long siege, he dismantled and reduced it to the condition of a village, confiscating all the property of the inhabitants. He remained in Asia some time after the victory over Niger, and made an expedition into Mesopotamia, where he obliged the Parthians to raise the siege of Nisibis, and gained other advantages over the Barbarians on the frontiers.

Severus was now too great to think of sharing his power with a partner: he accordingly deprived Albinus of the prerogatives attaching to the title of Cæsar, while Albinus laid claim to the rank of Augustus. An open rupture ensued, and each prepared to decide the contest. They met at Lyons, each at the head of 150,000 men, equal in valour and discipline. Severus was the conqueror, and his rival destroyed himself. This event took place in 197. Severus being now undisputed master of the empire, indulged without restraint his disposition to cruelty. After putting to death the family of Albinus, and all the prisoners of rank taken in the battle, together with many citizens in the towns of Gaul, which had favoured his rival, he extended his severity to the Roman senate, which had displayed an

inclination towards the cause of Albinus. By way of insult to that body, he conferred divine honours on the tyrant Commodus, whose memory they had declared to be detestable and infamous; and when he returned to Rome, he made a reproachful and menacing speech to the assembled senate, followed by the execution, without trial, of twenty-nine, or, as another account says, of forty-one of the most distinguished members, whom of his own accord he pronounced guilty of favouring the enemy. Conscious of having thus made himself odious to the superior classes, he endeavoured, by all the means in his power, to ingratiate himself with the people at large by public exhibitions, and by exemptions from certain duties; and it has been affirmed that, notwithstanding his tyranny, peace and prosperity were generally prevalent throughout the empire during the reign of this emperor. Severus studiously cultivated the affection of the soldiery, by the augmentation of their pay, and by privileges and indulgences which he granted them, and which have been considered as materially tending to introduce that relaxation of military discipline which in the end put a period to the Roman empire.

He supplied the place of the prætorian guards, whom he had disbanded, by a more numerous body, selected from all the legions, and consisting, in great part, of the natives of barbarous nations; and he conferred unusual authority on their commander Plautianus. To his reign is chiefly attributed the introduction of those maxims of imperial prerogative which entirely put an end to all ideas of a republic, and placed the government upon the footing of an absolute and unlimited monarchy. The indolence of the capital did not suit the disposition of Severus. Learning that, while he was engaged with Albinus, the Parthians had made an irruption into Mesopotamia, and threatened Nisibis, he hastened into the East, and not only relieved that city, but took Seleucia and Ctesiphon. He then marched towards Armenia, the king of which country sued for peace, and obtained it. Some successful incursions into Arabia concluded his eastern expedition, from which he returned in the year 203, after an absence of five or six years. He celebrated his victories by many splendid spectacles; and in the same year he married his son Caracalla, whom he had some years before created Augustus, to the daughter of Plautianus; his second, Geta, had been elevated to the rank of Cæsar, and both these princes had received their honours at a very early age. This union, which seemed likely to exalt the favourite minister Plautianus to the summit of fortune, was the cause of his destruction, for Caracalla, who had acquired a great ascendancy over his father, scorned his bride, and hated her father, and procuring an accusation against him of having formed a conspiracy to take away the emperor's life, he caused him to be killed in the presence of Severus. His death drew after it that of many of his relations and adherents, and the cruelty of the emperor increased with his years. The reciprocal hatred between his two sons, and the ferocious character of the eldest, were sources of the utmost disquietude to him in the midst of his external prosperity. He in vain employed every argument to reconcile them, and at length he placed them on a perfect equality, by raising Geta, as well as his brother, to the rank of Augustus. It was chiefly with a view of removing these princes from the licentiousness of the capital, and keeping them under his own eye, that in the year 208 he undertook an expedition to the northern part of Britain, the uncivilized tribes of which had made incursions into the Roman provinces. He took his sons with him, and at the head of a powerful army proceeded beyond the walls of Adrian and Antoninus, and penetrated to the northern extremity of the island.

island. He was harassed by the natives, who did not dare to meet him in the field, and he suffered much from the severity of the climate. At length the Caledonians purchased peace by surrendering all the country south of the Clyde and Forth, which he secured by raising a rampart between these firths. The attempts against his life by his son Caracalla, joined to age and a declining state of health, so reduced him, that he died at York in the year 209, in the 66th year of his age. In his last moments he recommended concord to his sons, and his sons he recommended to the protection of the army. Gibbon speaks of Severus ending a glorious and successful reign, but other historians have doubted whether Severus ought to be reckoned among the good or the bad emperors; for while his perfidy towards his competitors, his cruelty to vanquished enemies, and the general severity of his administration, justify a very unfavourable view of his moral character, it is not denied that he possessed in a high degree the virtues of industry and vigour, the love of order, attention to correct abuses, strict and impartial administration of justice, and simple and frugal habits of life. He was a good judge of the characters of men, and the empire was in general well administered and prosperous during his reign.

He is supposed to have been favourable, in the early part of his reign, to Christians, but the rapid increase of their number seems to have alarmed him, and he is reckoned the author of the fifth persecution, which took place in the tenth year of his reign, and which lasted with more or less violence, according to Dodwell, two years, and according to Bafnage, six years and upwards. See Lardner's Works, vol. viii. ed. 1790. ch. 23.

SEVERUS, CORNELIUS, a Roman poet, who lived in the reign of Augustus, was author of a poem entitled "*Ætna*," which has sometimes been attributed to Virgil. He is reported by Quintilian to have given a relation in verse of the Sicilian war, and some lines of his on the death of Cicero are quoted by Seneca the orator. It is to him that Ovid is supposed to have addressed one of his Pontic elegies, in which he is termed "*Vates magnorum maxime regum*." An elegant edition of the remains of this writer, was published with notes at Amsterdam in 1703, by Le Clerc: and they are printed in Mattaire's "*Corpus Poetarum*."

SEVERUS, SANCTUS, a Christian rhetorician and poet, was a native of Aquitaine, and flourished in the fourth century. He wrote an eclogue, which is still extant, where, in a dialogue between a Pagan and a Christian, he treats of the mortality of cattle. It was first printed in the "*Poemata Vetera*" of Pithæus, and has been several times republished. Gronovius gave an edition of it, with a preface, under the title "*Severi Sancti five Endeleichii Rhetoris de mortibus Boum Carmen, ab Elia Vinetto et Petro Pethæo servatum, cum notis John Weitzii et Wolfgang. Lug. Bat. 1715*." Another edition was published by D. Richtern, with a preface, in 1747.

SEVESE, in *Geography*, a town of Italy, in the Milanese; 8 miles N.N.W. of Milan.

SEVIAMALLY, a town of Hindoostan, in the Carnatic; 19 miles W. of Trichinopoly.

SEVIER, a county of Tennessee, Hamilton district, containing 3419 inhabitants, of whom 162 are slaves.

SEVIERVILLE, a post-town and capital of the above county; 555 miles from Washington.

SEVIGNAC, a town of France, in the department of the Lower Pyrenées; 9 miles N. of Morlaas.

SEVIGNÉ, MARIE RABUTIN, *Marquise de*, in *Bio-graphy*, a distinguished lady, was born in 1626. Her father, baron of Chantal and Bourbilly, died while she was

very young, leaving her heirs of the house of Buffly Rabutin. Her rank, and the graces of her person and conversation, procured her many admirers, and in 1644 she married the marquis de Sevigné, who in 1651 was killed in a duel. She from this time devoted herself to her children, and to the cultivation of her own mind. She had an extraordinary affection for her daughter, who, in 1669, married the count de Grignan, and accompanied him to his government of Provence, and this separation gave rise to the greater part of the letters which have gained her so high a reputation, though she had many other correspondents. Many of M. de Sevigné's letters are of a domestic nature, but others are enlivened with court anecdotes, remarks on men and books, and topics of the period in which they were written, which render them very amusing; and in point of style, they are models of epistolary writing, which, perhaps, have never been surpassed. In her letters to her daughter, the reader sometimes is hurt with the excess of flattery on her talents and beauty, which latter quality appears to have been a principal source of her maternal tenderness, and the preservation of it the great object of her anxiety. This lady died in 1696, at the age of 70. Though endowed with much penetration, and, to a certain degree, with a cultivated understanding, she did not rise much above the level of her age and sex in taste and principles. She was attached to rank and splendour, loved admiration, and was apt to be taken with frivolous accomplishments in preference to solid worth. She had a deep sense of religion, but wished to conciliate it with the polite world, the manners and maxims of which, according to the rigid system of the Catholics, were entirely at variance with it. She has been censured for want of taste in her insensibility to the poetical merit of Racine, but this has been imputed to her prepossessions in favour of Corneille. The best editions of her letters are that in 8 vols. 1775; and that in 10 vols. 1801.

SEVIGNY, in *Geography*, a town of France, in the department of the Ardennes; 12 miles N.W. of Rethel.

SEVIL, in the *Manege*. The sevil of the branches of a bridle is a nail turned round like a ring, with a large head, made fast in the lower part of the branch, called *gargouille*. See BANQUET.

SEUIL, in *Geography*, a town of France, in the department of the Ardennes, on the Aisne; 12 miles S.E. of Rethel.

SEVILLE, a province of Spain, commonly called the kingdom of Seville, is now exclusively, but improperly, denominated Andalusia, and occupies the western part of ancient Bætica. Its figure is irregular, 58 leagues long from E. to W., and 27 broad from N. to S.; a point of it bending towards the Straits of Gibraltar, 14 leagues from N. to S. and 9 from E. to W. It is bounded to the E. by Cordova; to the E. and S.E. by Grenada; to the S. by the Atlantic and the Straits of Gibraltar; to the W. by the kingdom of Algarva, &c.; and to the N. by Eltramadura. There are two sea-ports in this province, the one in the Mediterranean at Algeziras, the other on the Atlantic at Cadiz: the latter is spacious and beautiful, the best known, and the most frequented in Spain; its bay is eight leagues round. The principal towns of the kingdom of Seville are its own capital, Seville, an archiepiscopal see; Cadiz, an episcopal see, fortrefs, and sea-port; Santa-Maria, a sea-port; Xeres, Ecija, and Oñuna, inland towns. Its rivers are, the Saltes, Guadiana, Tinto, Odiel, Chanca, Verde, Barbate, Guadalete, Guadalquivir, Xenil, Guadianar, Guadaya, Las Feguas, Camdon, and San-Pedro.

SEVILLE,

SEVILLE.

SEVILLE, in Spanish *Sevilla*, and in Latin *Hispalis*, the capital of the above kingdom, is a large handsome city, one of the first in Spain, and so ancient, that it is mentioned by Strabo, Pomponius Mela, Pliny, and Ptolemy, as being ancient even in their time. Fable ascribes its origin to Hercules, Bacchus, to the Hebrews, to the Chaldeans, and to the Phœnicians; but its real founder is unknown. From the Romans it obtained the privilege of a Roman colony, and it was called "Julia Romula," or Little Rome. This town has often changed its sovereign and its form of government. It was formerly subject to the Gothic kings, who made it the place of their residence; and in 582 it took part in the rebellion of Ermenegild, son of king Leudivigild. In 711, it opened its gates to the Moors; and in 1027 it supported the rebellion of the Moor, who was its governor, in favour of the king of Cordova, whom it proclaimed king of Seville. Restored to the empire of the sovereigns of Cordova, it again raised the standard of rebellion in 1144, and chose itself a king, whose descendants united Cordova to their new dominions. Aben-hut, the last of those kings, being assassinated at Almeria, and Ferdinand II., king of Castile and Leon, having seized upon Cordova and Jaen in 1236, it threw off all authority, formed itself into a republic, and was governed by its own laws. In its turn, however, it experienced the power of a conqueror. Ferdinand II. assembled his forces before Seville in 1247, and compelled it, after a year's resistance, to surrender 23d of Nov. 1248. From the period of this memorable siege Seville has always made a part of the dominions of the kings of Castile.

Seville is situated on a beautiful and extensive plain, on the banks of the Guadalquivir. Its shape is circular, and its circumference, as it was left by the Romans, is surrounded by a wall more than a league in circuit, flanked by 176 towers: the number of gates is 12, that of Triana being of Doric architecture, and ornamented with columns and statues. Over one of the gates is the following inscription:

"Condidit Alcides, renovavit Julius Urbem,
Restituit Christo Fernandus Tertius, Heros."

The town is badly planned, the streets being narrow, crooked, and ill-paved: the houses, however, are tolerably well built, and, including those of the suburbs, amount to 11,820 in number. The number of inhabitants is stated by Mr. Townsend at 80,268, contained in 30 parishes, 84 convents, and 24 hospitals. Laborde estimates the present population, since the decline of its commerce, at 96,000. Many of the houses have large courts, surrounded by galleries or columns, with fountains in the middle. In summer the families live in the galleries, or courts, where they spread tents. In Seville there are many squares, the best of which are La Lonja, or the Exchange; the Hotel de Ville; the Arsenal, at the entrance of the harbour, with the Custom-house and the Gold-house, in which the gold and silver brought from the Indies are deposited: here are also several fine suburbs, and a handsome promenade, called Alameda, having three walks planted with trees, and ornamented with seats and fountains. This city is the see of an archbishop; and of the public ecclesiastical edifices, the first that demands attention is the cathedral, chiefly admired for its tower, constructed by Guever the Moor; originally, viz. A.D. 1568, 250 feet high, and afterwards raised 100 feet. It is so easy of ascent, and at the same time so spacious, that two horsemen may ride up abreast; and on the top is the Giralda, or brazen image, which, with

its palm-branch, weighs near $1\frac{1}{2}$ ton, and yet turns with the slightest variation of the wind.

The dimensions of the cathedral are 420 feet, by 263; and the height is 126 feet. It was built A.D. 1401. It receives light by fourcore windows with painted glass, the work of Arnao of Flanders, each of which cost 1000 ducats.

The treasures of this church are inestimable: one altar is wholly silver, with all its ornaments, as are the images, large as life, of S. Isidore and S. Leander, and a custodia or tabernacle for the host more than four yards high, adorned with forty-eight columns; yet these are trifling in value, when compared with the gold and precious stones deposited by the piety and zeal of Catholics, during the period in which all the wealth of a newly-discovered world flowed into this city. The profusion of gold, of silver, and of gems, would be more striking, were not the attention occupied and lost in admiration of innumerable pictures, the works of those Spanish masters who flourished immediately after the revival of the art in Seville. Every chapel preserves some monuments of their superior skill. Of these, the most conspicuous are of Luis de Vargas, and of Fr. Zurbaran, but chiefly of Murillo. By the last is a Nativity in the chapel of the Conception, and, near the baptismal font, S. Anthony of Padua, with the Baptism of Christ. In the principal sacristy, are his much admired pictures of S. Isidore with his brother S. Leander; and in another sacristy his Holy Family, and an Ecce Homo by Morales. The chapter-house is wholly devoted to Murillo, and the chapel of S. Peter is given up to Zurbaran. The works of Luis de Vargas are dispersed in various places; but his famous picture called de la Gamba, is in a chapel near the gate of S. Christopher, and merits particular attention.

To the cathedral belongs a library of 20,000 volumes, collected by Hernando, son to Christobal Colon, the first discoverer of America, a man of taste, and much admired in his day for learning. It is to be lamented, that modern publications have not been added to complete what was so well begun by him.

The construction of the organ is peculiar; it contains 5300 pipes, with 110 stops, being, as it is said, 50 more than those of the famous one at Haerlem, yet, so ample are the bellows, that when stretched they supply the full organ fifteen minutes. The mode of filling them with air is singular; for instead of working with his hands, a man walks backwards and forwards along an inclined plane of about fifteen feet in length, which is balanced in the middle on its axis; under each end is a pair of bellows of about six feet by three and a half. These communicate with five other pair united by a bar; and the latter are so contrived, that when they are in danger of being overstrained, a valve is lifted up, and gives them relief. Passing ten times along the inclined plane fills all these vessels.

In the cathedral are eighty-two altars, at which are said daily five hundred masses. The annual consumption is fifteen hundred arrobas of wine, eight hundred of oil, and of wax about one thousand.

The wealth belonging to this chapter may be estimated by the numbers that are supported by it.

The archbishop, with a revenue of three hundred thousand ducats; or, in sterling, nearly thirty-three thousand pounds a-year.

Eleven dignitaries, who wear the mitre on high festivals, amply, but not equally, provided for.

Forty canons, of forty thousand reals, or about four hundred pounds each *per annum*.

Twenty

Twenty prebendaries, with an income of thirty thousand reals each.

Twenty-one minor canons, at twenty thousand reals each.

Beside these, they have twenty chanters, called Veinteneros, with three assistants, called Sochantres, two beadles, one master of the ceremonies, with a deputy, three attendants to call the roll and mark the absentees, thirty-six boys for singing and for the service of the altar, with their rector, vice-rector, and music-masters; nineteen chaplains, four curates, four confessors, twenty-three musicians, and four supernumeraries; in all, two hundred and thirty-five.

Many of the convents are remarkable for the beauty of their architecture; but, in Seville, the eye covets only pictures, and amidst the profusion of these, it overlooks works, which in other situations would rivet the attention, and every where fixes on the pencil of Murillo. His most famous performances are in the Hospital de la Caridad, and, suited to the institution, express some acts of charity; such as the Miracle of the Loaves and Fishes; the smiting of the Rock in Horeb; the Pool of Bethesda; the Reception of the returning Prodigal; Abraham addressing the three Angels, and pressing them to enter his habitation; the Deliverance of Peter from the Prison; and Charity, in the person of Elizabeth, washing the wounds and curing the diseases of the poor. Beside these, in the same hospital, is the Annunciation of the blessed Virgin; and two little pictures, the one of the infant Jesus, the other of John.

The church of the Capuchins is richly furnished with his works; and although in these the composition is more simple than in the former, yet they may be considered as some of the best of his productions. Eleven of his pictures are to be seen in a chapel called de la Vera Cruz, belonging to the Franciscans. These do much credit to his pencil; and not inferior to them, are many preserved in other convents; such as, an Ecce Homo, and the blessed Virgin, with the infant Jesus, in the church of the Carmelites; the Flight into Egypt, in that of La Merced Calzada; a rich variety of subjects in S. Maria de la Blanca; and S. Augustin writing, with S. Thomas of Villanueva, stripping himself to clothe the poor, in the convent of the Augustin friars, near the gate of Carmona. In the opinion of Mr. Townsend, the most masterly of all his works is in the refectory of an hospital designed for the reception of superannuated priests. It represents an angel holding a basket to the infant Jesus, who, standing on his mother's lap, takes bread from it to feed three venerable priests. No representation ever approached nearer to real life, nor is it possible to see more expression, than glows upon that canvas. In the parochial church of Santa Cruz are two pictures in a superior style, a Stabat Mater Dolorosa, which excels in grace and softness; and the famous Descent from the Cross, of Pedro de Campana, which Murillo was accustomed daily to admire, and opposite to which, by his own directions, he was buried.

This great painter was born A.D. 1618, and died in 1682.

His name stands high in Europe; but to form an adequate idea of his excellence, every convent should be visited, where he deposited the monuments of his superior skill.

In exactness of imitation he was equalled; in *claro ob-scuro*, and in reflected lights, he was surpassed by Velazquez; but not one of all the Spanish artists went beyond him in tenderness and softness.

Of the convents, that which is upon the most extensive scale belongs to the Franciscans. It contains fifteen clois-

ters, many of which are elegant and spacious, with apartments for two hundred monks; but at present they have only one hundred and forty in their community. These, like all their order, are fed by charity, and are much favoured by the people. Their annual expenditure is more than four hundred thousand reals, or in sterling about four thousand pounds, amounting to twenty-eight pounds eleven shillings and five-pence for each. But then out of this must be deducted the expence of wine, oil, and wax, with the alms distributed daily to the poor, which altogether is considerable.

Among all the hospitals, Mr. Townsend was most pleased with that of La Sangre, designed for the reception of female patients. The front is elegant, and the sculpture is much to be admired, more especially the three figures of Faith, Hope, and Charity. The wards are spacious, and the whole is remarkable for neatness.

Our limits will not allow our introducing particular descriptions of other public buildings; such as the Torre del Oro, the Plaza de Toros, the Aqueduct with its four hundred and ten arches, and especially the Exchange. The latter, planned by Herrera (A.D. 1598), and worthy of its great architect, is a quadrangle of two hundred feet, with a corridor or spacious gallery round it, adorned with Ionic columns, and supported by an equal number of Doric.

The university was founded in the year 1502, and soon rose into consideration. The name of Arias Montanus, who lies buried at the convent of S. Jago, is alone sufficient to give celebrity to this seminary. His translation of the holy scriptures will be valued by the learned, as long as the scriptures themselves shall be the objects of veneration to mankind. The number of under-graduates here is about five hundred.

We meet at Seville with the favourite institutions of count Campomanes, his academy for the three noble arts of painting, sculpture, and architecture, and his economical society of the friends of their country. Both these have been attended with success, and have given assistance not only to the arts, but to agriculture, to manufactures, and to commerce. About two hundred pupils attend the former.

The alcazar, or royal palace, built by the Moors, is very spacious. The principal article of manufacture in Seville is snuff; and it furnishes also cigars to a very considerable amount. The silk manufacture was also formerly very flourishing in this place; so that in the year 1248 it employed 16,000 looms, and 130,000 persons; and such was then the population of the city, that the Moors who left it, when it was surrendered to the Christians, were 400,000, besides multitudes who died during a sixteen months' siege, and many who remained after their fellow-citizens were gone. But in consequence of the accumulation of taxes and other circumstances, the number of looms has been very much diminished; so that A.D. 1740, the looms for wide silks amounted to 462, and for other purposes to 1856.

The country round the city to a considerable distance lies so low, that it is frequently overflowed, and upon some occasions the water has been eight feet high, even in their habitations. The soil is rich, and being at the same time very deep, its fertility is inexhaustible. The produce is corn, leguminous plants, hemp, flax, lemons, oranges and liquorice. The quantity of this exported from Spain is said to be annually not less than four thousand quintals, or nearly two hundred tons, a considerable part of which

is supposed to be purchased by the porter-brewers in London.

In consequence of vapours and miasmata, occasioned by stagnant water, and by frequent floods, the inhabitants of Seville and its neighbourhood are subject to tertians, to putrid fevers, and to hysterical disorders. The predisposition to such diseases may be likewise sought for in the quantity of cucumbers and melons consumed by them all the year, in consequence of which they are likewise infected with worms, accompanied with epilepsies, especially in the more youthful subjects. Other diseases arise from heat, whenever they have the Solano wind, that is, whenever the wind blows from Africa, they become liable to pleurisy, and also a very pernicious irritability of nerves. N. lat. $37^{\circ} 12'$. W. long. $6^{\circ} 8'$.

SEVILLA *del Oro*. See MACAS.

SEVILLE *Plantation*, a place on the N. coast of Jamaica, W. of Mammee bay, where are the ruins of an ancient town, called "Sevilla Nueva," founded by Esquivel on the spot where Columbus resided after his shipwreck in the year 1503.

SEVILLETA, a town of New Mexico; 100 miles S. of Santa Fé.

SEVIN, FRANCIS, in *Biography*, a man of letters, born in the diocese of Sens, was educated at Paris, where he pursued, with great ardour, the study of the learned languages, in company with the abbé Fourmont the elder. He became an associate of the Academy of Belles Lettres in Paris in 1714. He was sent in 1728, by the king's command, with the abbé Fourmont the younger, to Constantinople, in search of MSS., of which he brought back a great number, and was, in 1737, presented with the place of keeper of MSS. in the king's library. His letters, descriptive of this journey, were published in 1801, in one vol. 8vo. These contain several interesting details concerning Turkey, Egypt, &c. Sevin died in 1741. Several of his papers are published in the "Memoires de l'Acad. des Inscriptions."

SEVION, in *Geography*, a river of North Wales, which runs into the Clyde; 3 miles N.W. of St. Asaph.

SEVIR, among the Romans, an officer who, according to Ptolemy, commanded a whole wing of horse; though others make him only the commander of a troop, *turmis*, a division answering to our regiments.

SEVIRI were also magistrates in the colonies, so called, from their being six in number.

SEURAH, in *Geography*, a town of Hindoostan, in Bundelcund; 18 miles N. of Callinger.

SEVRE, or *Sevre Nantaise*, a river of France, which rises about eight miles W. from Parthenay, passes by Mortagne, Tiffauges, Clisson, &c. and runs into the Loire, opposite to Nantes.

SEVRE *Niortaise*, a river of France, which rises near St. Maixent, passes by Niort, Marance, &c. and runs into the sea; 7 miles W. of Marance.

SEVRES, a town of France, in the department of the Seine and Oise, and chief place of a canton, in the district of Versailles. The place contains 2643, and the canton 3485 inhabitants, on a territory of 50 kilometres, in eight communes.

SEVRES, *Two*, one of the nine departments of the western region of France, formerly Lower Poitou, between Vendée and Vienne, in N. lat. $46^{\circ} 30'$, containing $6337\frac{1}{2}$ kilometres, or 305 square leagues, and 242,658 inhabitants. This department comprehends 4 districts, 30 cantons, and 363 communes. The districts or circles are, Thouars, including 43,543; Parthenay, 53,020; Niort, 84,923; and

Melle, 61,167 inhabitants. Its capital is Niort. According to Hallenfratz, the extent is 32 French leagues in length, and 12 in breadth: the number of circles is 6, and of cantons 50, and the population is 259,122. The contributions in the 11th year of the French era amounted to 2,556,115 francs; and the expences for administration, justice, and public instruction, to 233,694 francs 66 cents. The soil of this department, in general, is fertile, yielding grain, wine, fruits, and pastures. The S.W. district is marshy.

SEVRI, a river of Natolia, which runs into the Sakaria, near Sevrihisar.

SEVRIHISAR, a town of Asiatic Turkey, in Natolia, at the conflux of the Sevri and Sakaria; 60 miles W. of Angora. N. lat. $39^{\circ} 53'$. E. long. $32^{\circ} 2'$.

SEURRE, a town of France, in the department of the Côte d'Or, and chief place of a canton, in the district of Beaune; 21 miles S. of Dijon. The place contains 2777, and the canton 11,546 inhabitants, on a territory of 280 kilometres, in 23 communes. N. lat. $46^{\circ} 58'$. E. long. $5^{\circ} 12'$.

SEVSK, a town of Russia, in the government of Orel, on the Sev; 56 miles S.W. of Orel. N. lat. $52^{\circ} 15'$. E. long. $34^{\circ} 44'$.

SEUTZACH, a town of Switzerland, in the canton of Zurich; 17 miles N.N.E. of Zurich.

SEVYNVEY, a river of South Wales, which runs into the Clethy, in Pembrokeshire.

SEW, in *Sea Language*, the situation of a ship when the water first leaves her resting on the ground, or blocks in a dock. Thus, if a ship runs a-ground on the tide of ebb, or by the reflux of the tide she rests on her blocks; and if it be required to know she has sewed, or how much she has sewed, the mark the water-line has made on her bottom when afloat is examined, and as much as is the difference above the surface of the water and this mark, so much she is said to have sewed.

SEW is also a term applied to a cow, signifying to go dry.

SEWAD, or SOWHAD, in *Geography*, a province of Candahar, situated on the W. side of the Indus, which separates it from Puckholi; 40 cosles long and 15 broad. This province, as well as Bijore, is very mountainous, and abounds with passes and strong situations; so that their inhabitants have not only held themselves generally independent of the Mogul emperors, but have occasionally made very furious inroads into their territories. The country of the Affaceni, or Affacani, answers to Sewad; Affenagur being the ancient name of Sewad; or rather Sewad was one of the subdivisions of Affenagur. At present Sewad includes the three provinces of Sewad *proper*, Bijore, and Beneer.

SEWAD, the easternmost and largest of the four rivers that unite successively with the river Cabul, before it falls into the Indus; the other three being that which passes by the town of Bijore, the Penjakoreh river, separating Bijore on the W. from Sewad on the E., and the Chendoul river, which is a branch of the Bijore river.

SEWALICK, or SEWA-LUCK, a chain of mountains forming the northern boundary of Hindoostan, and separating the country of Lahore from Thibet.

SEWAN, or ALLIGUNGE, a town of Hindoostan, in Bahar; 32 miles N.N.W. of Chuprah. N. lat. $26^{\circ} 11'$. E. long. $84^{\circ} 32'$.

SEWARD, THOMAS, in *Biography*, an English divine of the church of England, was born in 1708. He became rector of Eyam, in Derbyshire, and prebendary of Litchfield, where he died in 1790. He was a man of taste and learning,

ing, and of considerable talents for poetry and polite literature. He published an edition of Beaumont and Fletcher's works, and was author of a treatise on the "Conformity between Popery and Paganism." Some of his poems are in Dodsley's collection.

SEWARD, ANNA, daughter of the preceding, a poetess of distinguished elegance, was born about the year 1745. Her infant mind was nourished by her father with the vivid and sublime imagery of Milton, and her early education amidst the wild and alpine scenery of the Peak, enhanced the enthusiasm of feeling to which she was naturally disposed. In her seventh year, her father being appointed canon residentiary of Litchfield, she removed with the family to that city, which thenceforth became her residence during the whole of her life. The fruit of her father's instructions appeared in some early efforts at poetical composition, which, however, met with discouragement from her mother; and Mr. Seward was afterwards induced to withdraw the countenance he had given to her literary pursuits; so that several years of her youth elapsed with only stolen and interrupted attempts to cultivate an art of which she had so strongly imbibed the rudiments. As she advanced in life, she of course followed more freely the bent of her genius, and in 1780 she published an "Elegy on Captain Cook," a performance of great merit, as well from the harmony of its versification, as the beautiful and appropriate imagery with which it abounds, and the force and delicacy of its sentiments. The contrast between the different mourners on this event, queen Oberea, and the wife of the great navigator, is peculiarly striking. In the following year she gave the world a "Monody on Major Andre." With this lamented young officer she was intimately acquainted: she accordingly wrote with peculiar pathos on the occasion, and expressed a glowing, and we scruple not to say, a just indignation against the actors in that tragedy: the laws of what are called civilized war do not and ought not to suppress the feelings of humanity. Miss Seward made herself known as a writer on many other topics: in 1790 she published "Llangollen Vale," with other poems; and in 1804 she gave the public "Memoirs of the Life of Dr. Darwin." This is a desultory performance, but it contains much entertaining matter, enriched with some judicious criticism on Dr. Darwin's poetical character. Miss Seward died in March 1809. A collection of her letters has been published since her decease, in six vols. 12mo. Athenæum. Monthly Mag.

SEWARD, WILLIAM, was the son of a brewer in London, and born in 1797. He received his education at the Charter House, which he completed at Oxford; this place he left without taking a degree. Having a good fortune, he devoted his life to literary ease, and antiquarian researches. He is known as an author by five volumes of "Anecdotes of distinguished Persons," extracted from curious books, to which he added a supplement, in two volumes, under the title of "Biographiana." Europ. Mag.

SEWARY, in *Geography*, a town of Hindoostan, in the circar of Surgooja; 22 miles E. of Surgooja.

SEWEE, a country of Asia, between Persia and Hindoostan, on the W. side of the Indus.

SEWEE Bay, or *Bull's Harbour*, a bay of the Atlantic, on the coast of South Carolina. N. lat. $32^{\circ} 58'$.

SEWEESTAN, a country of Hindoostan, between Sewee and the Indus, about 110 miles long and 50 broad.

SEWEL, among *Sportsmen*, denotes any thing that is set or hung up, to keep a deer out of any place.

SEWEL-Coronde, a name given by the natives of Ceylon to a species of cinnamon, which, when chewed, is of a

mucilaginous nature, like the cassia: this dries well, and is very firm and hard, and has the appearance of a very fine cinnamon; but it has very little taste, and a disagreeable smell. The natives take advantage of the handsome appearance of this kind of cinnamon, and are very apt to mix it with the good kind, to the great detriment of the buyer. Phil. Trans. N^o 409.

SEWER, formed from the French *escuyer, esquire, gentleman*, or *usher*, in the *Household*, an officer who comes in before the meat of a king, or nobleman, to place and range it on the table. Of these officers there are four in the king's household, and eight, called sewers of the great chamber.

SEWERS, in *Building*, are shores, conduits, or conveyances, for the suillage and filth of a house.

SEWERS, *Clerk of the*. See CLERK.

SEWERS, *Commission of*. See COMMISSION.

SEWIN, in *Ichthyology*. See GREY.

SEWL, in *Agriculture*, provincially a plough. It is sometimes written *sule*. See PLOUGH.

SEWNADY, in *Geography*, a town of Hindoostan, in the circar of Ruttunpour; 35 miles N. of Ruttunpour.

SEWNY, a town of Hindoostan, in Goondwanah; 60 miles N.N.E. of Nagpour.

SEX, SEXUS, something in the body, which distinguishes male from female. See GENERATION.

The number of persons, of the two sexes, are exceedingly well balanced; so that every man may have his wife, and every woman her husband.

Hermaphrodites have the apparent marks of both sexes. It is expressly forbidden by the law of Moses, to disguise the sex.

SEXAGENARY, SEXAGENARIUS, something relating to the number sixty: more particularly a person arrived at the age of sixty years.

Some casuists dispense with sexagenarians for not fasting: the Papian law prohibits sexagenarii from marriage; because at that age the blood and humours are frozen.

SEXAGENARY *Arithmetic*. See SEXAGESIMAL.

SEXAGENARY *Tables*, are tables of proportional parts, shewing the product of two sexagenaries that are to be multiplied; or the quotient of two to be divided.

SEXAGESIMA, the second Sunday before Lent, or the next to Shrove Sunday; so called, as being about the fiftieth day before Easter.

Sexagesima is that which follows Septuagesima, and precedes Quinquagesima.

SEXAGESIMAL, or SEXAGENARY *Arithmetic*, a method of computation, proceeding by sixties.

Such is that used in the division of a degree into sixty minutes; of the minute, into sixty seconds; of the second, into sixty thirds, &c. See ARITHMETIC.

SEXAGESIMALS, or SEXAGESIMAL *Fractions*, are fractions, whose denominators proceed in a sexagecuple ratio; that is, a prime, or the first minute = $\frac{1}{60}$; a second = $\frac{1}{3600}$; a third = $\frac{1}{216000}$.

Anciently there were no other than sexagesimals used in astronomical operations, and they are still retained in many cases; though decimal arithmetic is now much used in astronomical calculations.

In these fractions, which some also call *astronomical fractions*, the denominator being always 60, or a multiple of it, is usually omitted, and the numerator only written down: thus, 4° , $59'$, $32''$, $50'''$, $16''''$, is to be read, 4 degrees, 59 minutes, 32 seconds of a degree, or 60th parts of a minute, 50 thirds, 16 fourths, &c.

SEXANGLE, in *Geometry*, a figure having six sides, and consequently six angles.

SEXDRAGA,

SEXDRAGA, in *Geography*, a town of Sweden, in West Gothland; 38 miles E. of Gotheborg.

SEXES of Plants, in *Vegetable Physiology*. See **FECUNDATION**, and **FRUCTIFICATION**.

SEXT, in *Geography*, a town of France, in the department of Mont Blanc; 2 miles S.E. of St. Maurice.

SEXTA PARS, Lat. a sixth vocal part in the motetti and madrigals of old masters.

SEXTANS, **SEXTANT**, a sixth part of certain things.

The Romans divided their *as*, which was a pound of brass, into twelve ounces: the ounce was called *uncia*, from *unum*; and two ounces *sextants*, as being the sixth part of a pound. See **AS**.

SEXTANS was also a measure which contained two ounces of liquor, or two cyathi. Hence,

“Sextantes, Caliste, duos infundi Falerni.”

SEXTANS, the *Sextant*, in *Astronomy*, a constellation of the southern hemisphere, made by Hevelius out of unformed stars. In Hevelius's catalogue it contains 11, but in the Britannic catalogue 41 stars. See **CONSTELLATION**.

SEXTANT, in *Mathematics*, denotes the sixth part of a circle, or an arc comprehending sixty degrees.

SEXTANT is more particularly used for an astronomical instrument, made like a quadrant; excepting that its limb only comprehends sixty degrees.

The use and application of the sextant is the same with that of the quadrant.

In the observatories of Greenwich and Pekin, there are very large and fine sextants.

SEXTARIUS, an ancient Roman measure, containing two cotylæ, or two heminæ. See **COTYLA**.

SEXTERY-Lands, are lands given to a church, &c. for maintenance of the sexton.

SEXTILE, **SEXTILIS**, the position or aspect of two planets, when at sixty degrees distance; or at the distance of two signs from one another. It is marked thus (*). See **ASPECT**.

SEXTILIS, in *Chronology*. See **AUGUST**.

SEXTON, a church-officer, thus called by corruption of the Latin *sacrista*, or Saxon *segerstane*, which denotes the same. His office is to take care of the vessels, vestments, &c. belonging to the church; and to attend the minister, churchwarden, &c. at church. He is appointed by the minister or others, and receives his salary according to the custom of each parish.

Sextons, as well as parish clerks, are regarded by the common law as persons who have freehold in their offices; and, therefore, though they may be punished, yet they cannot be deprived, by ecclesiastical censures.

The office of *sexton in the pope's chapel*, is appropriated to the order of the hermits of St. Augustine. He is generally a bishop, though sometimes the pope only gives a bishopric, *in partibus*, to him on whom he confers the post. He takes the title of *prefect of the pope's sacristy*, and has the keeping the vessels of gold and silver, the relics, &c.

When the pope says mass, the sexton always tastes the bread and wine first. If it be in private he says mass, his holiness, of two wafers, gives him one to eat; and, if in public, the cardinal, who assists the pope in quality of deacon, of three wafers, gives him two to eat. When the pope is desperately sick, he administers to him the sacrament of extreme unction, &c. and enters the conclave, in quality of first conclavist.

SEXTON'S River, in *Geography*, a river of America, in Vermont, which runs into the Connecticut, N. lat. 43°. W. long. 72° 25'.

VOL. XXXII.

SEXTULA, a word used by some pharmaceutic writers to express the sixth part of an ounce, that is, four scruples, or one drachm and one scruple.

SEXTUPLA, Ital. *Sextuple*, Fr. and Eng. in *Music*, implies a compound time of triplets mixed with binary time. Sextuple time is never properly used but in the faraband, consisting of six even crotchets, or quavers, expressed by $\frac{3}{4}$ or $\frac{3}{8}$, where triplets are out of the question. All other indications of compound measure, or, as formerly called, jig time, are at present the following; $\frac{6}{4}$, $\frac{6}{8}$, $\frac{9}{4}$, $\frac{9}{8}$, $\frac{12}{8}$; all which measures consist of triplets.

Old authors mention five different species of sextuple time: as,

SEXTUPLE of the Semibreve, by the French called triple of 6 for 1, as being denoted by those two numbers $\frac{6}{1}$; or because here are required six semibreves to a measure, in lieu of one, viz. three rising, and three falling.

SEXTUPLE of the Minim, called by the French triple of 6 for 2, as being denoted by $\frac{6}{2}$; which shew, that six minims are here required to a measure, instead of two.

SEXTUPLE of the Crotchet, called by the French triple of 6 for 4, because denoted by $\frac{6}{4}$, or $\frac{3}{2}$, which shew, that there must be six crotchets to a measure, in lieu of four.

SEXTUPLE of the Chroma, by the French called triple of 6 for 8, as being denoted by $\frac{6}{8}$; which shew, that six quavers here make the measure, or semibreve, instead of eight.

SEXTUPLE of the Semichroma, or triple of 6 for 16, so called, because denoted by $\frac{6}{16}$; which shew, that six quavers are here required to a measure, instead of sixteen.

SEXTUS, **SIXTH**, in the *Canon Law*, denotes a collection of decretals, made by pope Boniface VIII. usually thus called from the title, which is “*Liber Sextus*,” as if it were a sixth book added to the five books of decretals, collected by Gregory IX.

The *Sextus* is a collection of papal constitutions, published after the collections of Gregory IX. containing those of the same Gregory, Innocent IV., Alexander IV., Urban IV., Clement IV., Gregory X., Nicholas III., and Boniface VIII., by whose order the compilation was made. The persons employed in making of it were Will. de Mandegot, archbishop of Ambrun; and Berenger, bishop of Beziers; and Richard of Sienna. See **CANON LAW**.

SEXTUS, in *Biography*, an ancient philosopher of the stoical sect, was a native of Cheronea, and the nephew of Plutarch. He is celebrated as the preceptor of the emperors Lucius Verus and Marcus Aurelius.

SEXTUS, *Empiricus*, in *Medical History*, a Roman physician, of the *empiric* sect, who followed Heraclides and others in the adoption of that system which Serapion and Philinus begun. He is said to have been the pupil of Herodotus, the physician, and the preceptor of Saturninus. There are two works extant, with the name of Sextus attached to them; but Le Clerc believes, that they are not both the production of this physician, who only composed that which is entitled “*Sexti Placiti*,” and that the other work, which contains six books, treating of the doctrines of Pyrrhonism, and ten books relative to all the sciences, was the production of another Sextus, of Cheronea, who was of the Platonic school, a nephew of Plutarch, and preceptor of the emperor Marcus Aurelius. See *Le Clerc*, *Hist. de la Méd.* p. ii. chap. 8.

SEXTUS Oculi, in *Anatomy*, a name given by Fallopius to one of the muscles of the eye, called by Albinus, and others, the obliquus oculi inferior, and by some, the obliquus oculi brevis.

SEXTUS Thoracis, a name given by Fallopius, and others,

to a muscle, now generally known by the name of the triangularis sterni.

SEXUAL SYSTEM, in *Botany*, denotes that system, which is founded on a discovery, that there is in vegetables, as well as in animals, a distinction of the sexes; or that plants propagate themselves by means of male and female organs, either growing upon the same tree, or upon different trees of the same species. This system is suggested and confirmed by the analogy observable between the eggs of animals and the seeds of plants, both serving equally to the same end; viz. that of propagating a similar race; and by the remarks which have been made, that when the seed of the female plant is not impregnated with the prolific powder of the male, it bears no fruit; inasmuch that as often as the communication between the sexual parts of plants has been intercepted, which is the cause of their fecundity, they have always proved barren. The authors of this system, after exactly anatomizing all the parts of the plant, assign to each a name, founded on its use and analogy to the parts of an animal. Thus, as to the male organs, the filaments are the spermatic vessels, the antheræ the testicles, and the dust of the antheræ correspond to the sperm and seminal animalcules; and as to the female, the stigma is the external part of the female organ, which receives the dust; the style answers to the vagina; the germ to the ovary; and the pericarpium, or fecundated ovary, to the womb. See **VEGETATION**.

The sexual system was not wholly unknown to the ancients, though their knowledge of it was very imperfect. Accordingly we find in the account given by Herodotus (lib. i.) of the country about Babylon, where palm-trees abounded, that it was a custom with the natives, in their culture of these plants, to assist the operations of nature, by gathering the flowers of the male trees, and carrying them to the female. By this means they secured the ripening of the fruit; which might else, on account of unfavourable seasons, or the want of a proper intermixture of the trees of each sex, have been precarious, or at least not to have been expected in equal quantities. The ancients had also similar notions concerning the fig. Theophrastus (Hist. Plant. lib. iii. cap. 9.) observes, that the characteristic and universal difference among trees is that of their gender, whether male or female. And Aristotle (De Plantis, lib. i. cap. 2.) says, that we ought not to fancy, that the intermingling of sexes in plants is the same as among animals. However, there seems to have been a difference of opinion among the ancients as to the manner in which plants should be allowed to have a difference of sex. Some apprehended that the two sexes existed separately; and others thought that they were united in the same individual. Empedocles thought, that plants were androgynous or hermaphroditical, or that they were a composition of both sexes. Aristotle expresses his doubt upon this head. Empedocles (vide Arist. de Generat. Anim. lib. i. c. 23.) called plants oviparous; for the seed or egg, according to his account, is the fruit of the generative faculty, one part of which serves to form the plant, and the other to nourish the germ and root; and in animals of different sexes, we see that nature, when they would procreate, impels them to unite, and like plants to become one; that from this combination of two, there may spring up another animal.

As to the manner in which fruits were impregnated, the ancients were not ignorant that it was by means of the prolific dust contained in the flower of the male; and they remarked, that the fruits of trees never come to maturity till they had been cherished with that dust. Upon this subject Aristotle says (De Plant. lib. i. cap. 6.) that if one shakes the dust of a branch of the male palm-tree over the female,

her fruits will quickly ripen; and that when the wind flies this dust of the male upon the female, her fruits ripen apace, just as if a branch of the male had been suspended over her. And Theophrastus (Hist. Plant. lib. ii. cap. 9.) observes, that they bring the male to the female palm, in order to make her produce fruit. The manner in which they proceed, says he, is this: when the male is in flower, they select a branch abounding with that downy dust which resides in the flower, and shake this over the fruit of the female. This operation prevents the fruit from becoming abortive, and brings it soon to perfect maturity. Pliny also informs us (Nat. Hist. tom. i. lib. xiii. c. 7.) that naturalists admit the distinction of sex, not only in trees, but in herbs, and in all plants. Yet this is no where more observable, he adds, than in palms, the females of which never propagate, but when they are fecundated by the dust of the male. He calls the female palms, deprived of male assistance, barren widows. He compares the conjunction of these plants to that of animals; and says, that to generate fruit, the female needs only the aspersions of the dust or down of the flowers of the male.

Zaluzianski seems to have been the first among the moderns who clearly distinguished from one another the male, the female, and the hermaphroditical plants. About a hundred years after him, sir Thomas Millington, and Dr. Grew, communicated to the Royal Society their observations on the impregnating dust of the stamina. Grew's *Anatomy of Plants*, published in 1682.

Camerarius, towards the end of the last century, observed, that upon plucking off the stamina of some male plants, the buds that ought to have produced fruit came not to maturity. Malpighi, Geoffroy, and Vaillant, have also carefully considered the fecundating dust; the latter of whom seems to have been the first eye-witness of this secret of nature, the admirable operation that passes in the flowers of plants, between the organs of different sexes. Many authors afterwards applied themselves to improve this system; the principal of whom were Morland, Logan, Van Royen, Bradley, Ludwig, Blair, Wolfius, &c. But Linnæus had the honour of applying this system to practice, by reducing all trees and plants to particular classes, distinguished by the number of their stamina, or male organs. See Dutens' *Inquiry into the Origin of the Discoveries attributed to the Moderns*, 1769, chap. vii. Phil. Transf. vol. xlvii. art. 25.

The sexual hypothesis, on its first appearance, was received with all that caution which becomes an enlightened age; and nature was traced experimentally through all her variations, before it was universally assented to. Tournefort refused to give it a place in his system; and Pontederæ, though he had carefully examined it, treated it as chimerical. The learned Dr. Alston, professor of botany in the university of Edinburgh, violently opposed it; but the proofs which Linnæus has given amongst the aphorisms of his "*Fundamenta Botanica*," and farther illustrated in his "*Philosophia Botanica*," are so clear, that the mind does not hesitate a moment in pronouncing animal and vegetable conception to be the same; but with this difference, that in animals fruition is voluntary, but in vegetables necessary and mechanical. The impregnation of the female palm by the farina of the male, related by Mylius, in his letter to Dr. Watson (Phil. Transf. vol. xlvii. art. 25.) establishes the fact attested by the ancients concerning the palm-tree; and as the fructification in other vegetables, though it may differ in particular circumstances, has nevertheless a general conformity to that of the palm-tree, with respect to the parts supposed to be the organs of generation, which are discoverable either on the same or in a separate flower, we may, from this single experiment, deduce

an argument by analogy for the confirmation of the whole sexual hypothesis. Besides, a very striking proof of the analogy between plants and animals may be drawn from observations made in their infant states, at which early period they seem nourished and protected in a similar manner. Those who desire farther satisfaction, may see the several demonstrations collected, and methodically connected, in the "*Sponalia Plantarum*" of J. Gustavus Walhbon, published in the "*Amoenitates Academicæ*," at Leyden, in 1749. See BOTANY, CLASSIFICATION, FRUCTIFICATION, PLANTS, and VEGETATION.

SEXUALISTÆ, among *Botanical Authors*. See BOTANY, FRUCTIFICATION, and SEXUAL System.

SEXUNX, in *Pharmacy*, the weight of six ounces, or half a pound troy.

SEYBO, or **SEYVO**, in *Geography*, a settlement in the southern part of Hispaniola; 70 miles N.E. of St. Domingo.

SEYBORS DORF, a town of Prussia, in the province of Oberland; 6 miles S. of Liebstat.

SEYCHELLES, an island in the Indian ocean, N.E. of Madagascar; high and mountainous, and estimated at 72 miles in circumference. The soil appears to be rich and good, and the island is covered with trees, many of which would serve for masts and yards for ships, as they are large and straight: among the trees are great quantities of rose-wood, and coconut trees. Wild goats, land-tortoises, and Guinea-fowl, are found in plenty; and in the harbour abundance of good fish. The harbour is well sheltered from the south-east wind. When the winds are from the north and north-west, it is rather an open road, but the ground seems to hold well. The tide rises about six feet, and sets about S.S.W. High water full and change, thirty minutes past five. S. lat. $4^{\circ} 34'$. E. long. $55^{\circ} 35'$.

SEYDA, or **SEDAU**, a town of Saxony; 10 miles E. of Wittemberg. N. lat. $51^{\circ} 55'$. E. long. $12^{\circ} 59'$.

SEYDE. See SAIDE.

SEYDEWITZ, a river of Saxony, which runs into the Elbe, near Pirna, in the marggravate of Meissen.

SEYER. See PULO Seyer.

SEYER Oe, an island of Denmark, in the Cattegat, about eight miles long, and hardly one broad; about five miles from the coast of Zealand. N. lat. $55^{\circ} 53'$. E. long. $11^{\circ} 11'$.

SEYFFERS DORF, a town of Silesia, in the principality of Grotkau; 3 miles N.N.E. of Grotkau.

SEYFORTESVOLT, a town of Prussia, in the province of Ermeland; 9 miles S. of Heilsberg.

SEYGAR, in the *Materia Medica*, a name used by some authors for the nutmeg.

SEYGERSWALD, in *Geography*, a town of Prussia, in the province of Oberland; 4 miles N.E. of Salfeldt.

SEYLONG, a town of Hindooistan, in Oude, seated on a river which runs into the Goomty; 15 miles S.E. of Bareilly.

SEYMAN, an island in the Red sea. N. lat. $15^{\circ} 20'$. E. long. $57^{\circ} 30'$.

SEYMOUR, EDWARD, in *Biography*, brother of lady Jane Seymour, wife of HENRY VIII. (see his article), and uncle to Edward VI., was created viscount Beauchamp, earl of Hertford, and duke of Somerset. On the accession of his nephew to the throne he became his guardian, and protector of the kingdom. Not thinking that the vote of the executors of Henry VIII. was a sufficient foundation for the high authority which he partly assumed by the influence which his relationship to the king gave him, he procured a patent from Edward, by which he overset the meaning and

intent of the late king's will. In this patent he named himself protector, with full regal power, and appointed a council entirely of those persons whom he thought he could trust. The protector became the warm friend of the reformation, and consulted Cranmer on the best means of promoting the object he had at heart. He appointed a general visitation to be made in all the dioceses in England, the visitors consisting of a certain number of the clergy and laity, and they had their different circuits assigned them. The chief purport of their instructions was, besides correcting the immoralities and irregularities of the clergy, to abolish, but with a very lenient hand, ancient superstitions, and to bring discipline and worship somewhat nearer the practice of the reformed churches. Somerset made war upon Scotland, and upon his return in Nov. 1547, he called a parliament, and being elated with the successes which he obtained over the Scots, he procured from the young prince a patent, appointing him to sit on the throne, upon a stool at the right hand of the king, and to enjoy the same honours and privileges that had usually been possessed by any prince of the blood, or uncle of the kings of England. In this patent the king employed his dispensing power, by setting aside the statute of precedency enacted during the reign of his father. If, however, the protector gave offence by assuming too much state, he deserves high praise on account of the laws which were passed during this session, by which the rigour of former statutes was much mitigated, and some security given to those principles of freedom which seem to make a part of the constitution. All laws were repealed which extended the crime of treason beyond the statute of the twenty-fifth of Edward III.: all crimes enacted during the late reign extending the crime of felony; all the former laws against heresy, together with the statute of the six articles. None, in future, were to be accused for words, but within a month after they were spoken. "By these repeals," says Hume, "several of the most rigorous laws that were ever passed in England were annulled, and some dawn, both of civil and religious liberty, began to appear to the people."

About this time, most violent differences subsisted between the protector and his brother, Thomas Seymour, admiral of England. The ambition of the latter was insatiable: he was besides arrogant, assuming, and implacable; and though esteemed of superior capacity to the protector, he did not possess the same degree of confidence and regard of the people. By his flattery and address, he had so far insinuated himself into the favour of the queen-dowager, that she married him almost immediately upon the demise of the king. The credit of this alliance supported the ambition of the admiral, and gave great offence to the duchess of Somerset, who, uneasy that the younger brother's wife should have the precedency, employed all the credit she had with her husband, first to create, and then to widen the breach between the two brothers. Matters, at length, were carried so far, that the admiral was attainted of high treason, and executed by a warrant, which was signed by the hand of his brother, whose own disgrace was at no great distance.

After the duke of Somerset had obtained the patent, investing him, as it were, with full regal authority, he thought every one was in duty bound to yield to his sentiments. Besides his general hauteur, he gave great offence to the higher ranks of society, by the attention with which he evidently courted the applause of the people at large. For the relief of the latter he had erected a court of requests in his own house, and he interposed with the judges in their behalf, a circumstance that could not but be deemed illegal. Though the protector had thus courted the people, to the displeasure and disgust of the nobles, whom Hume represents as "the

surest support of monarchical authority," the interest which he had formed with them was in no degree answerable to his expectations. The Catholic party, who retained influence with the lower ranks, as might be expected, were his declared enemies, and took advantage of every opportunity to decry his conduct. The attainder and execution of his brother bore an odious aspect: the introduction of foreign troops into the kingdom was represented in invidious colours: the great estate which he had suddenly acquired at the expence of the church, and of the crown, rendered him obnoxious; and the palace which he was building in the Strand served, by its magnificence, and still more by other circumstances attending it, to expose him to the censure of the public. The parish church of St. Mary, with three bishops' houses, were pulled down, in order to furnish ground and materials for this structure. Not content even with this, which, at that period, was regarded as great sacrilege, an attempt was made to demolish St. Margaret's church, Westminster, and to employ the stones for the same purpose, but the parishioners rose in a tumult, and chased away the protector's tradesmen. He then laid his hands on a chapel in St. Paul's church-yard, with a cloister and charnel-house belonging to it, and these edifices, together with the church called the St. John of Jerusalem, were made use of to raise his palace. All these imprudences were remarked by Somerset's enemies, who resolved, when an opportunity offered, to take advantage of them to his ruin. A conspiracy was soon formed against him, and he resigned his office, hoping that with this concession his foes might be satisfied, but he was mistaken, they determined to pursue him even to the scaffold. He was committed to the Tower, with some of his adherents, and articles of indictment were exhibited against him, of which the chief was his usurpation of the government, and his taking into his own hands the whole administration of affairs. The clause of his patent, which invested him with absolute power, unlimited by any law, was never objected to him, because, says Mr. Hume, "according to the sentiments of those times, that power was, in some degree, involved in the very idea of regal authority." Somerset prevailed upon to confess on his knees, before the council, all the articles laid to his charge, and he imputed these misdemeanors to his own rashness and indiscretion, not to any malignity of intention. He even subscribed a paper which contained a full confession of his guilt; he was accordingly fined two thousand pounds a-year in land, and deprived of all his offices, and here the matter for the present ended; the fine was remitted, and he recovered his liberty. After this, he was re-admitted into the council, and soon obtained a considerable portion of popularity, which rendered him an object of jealousy to the duke of Northumberland, who planned his destruction. Under pretence of an intended insurrection, he had him seized, with his friends, and committed to the Tower. He was now brought to trial before a jury of twenty-seven peers, some of whom were his avowed enemies, and was of course found guilty, and condemned to death. Care was taken to prepossess the young king against his uncle, and lest he should relent, no access was allowed to the duke of Somerset's friends, and the prince was, by a continued series of occupations and amusements, kept from reflection. The prisoner was executed on Tower-hill, much to the regret of the great body of people, who entertained the hopes of pardon to the last. A vast multitude of those friendly to him were the witnesses of his death. Many of them dipped their handkerchiefs in his blood, which they preserved as a precious relic; and some of them, when Northumberland, his great enemy and one of his jurors, met with a like doom, upbraided him with this act of his cruelty, and

displayed to him these symbols of his crime. "Somerset, indeed," says Hume, "though many actions of his life were exceptionable, seems in general to have merited a better fate, and the faults which he committed were owing to weakness, not to any bad intention. His virtues were better calculated for private than for public life; and by his want of penetration and firmness, he was ill-fitted to extricate himself from those cabals and violences to which that age was so much addicted."

Somerset left three daughters, Anne, Margaret, and Jane, who were distinguished for their poetical talents. They composed Latin distichs on the death of Margaret de Valois, queen of France, which were translated into the French, Greek, and Italian languages, and printed in Paris in 1551. Anne, the eldest of these ladies; married first the earl of Warwick, the son of the duke of Northumberland, already mentioned, and afterwards sir Edward Hunton. The other two died single. Jane was maid of honour to queen Elizabeth.

SEYMOUR, ARABELLA, better known in history by the name of the lady Arabella, was daughter of Charles Stuart, earl of Lennox, youngest brother of Henry Darnley, husband to Mary queen of Scots. Her mother was daughter of sir William Cavendish of Chatsworth, in Derbyshire. Her affinity to the crown was the cause of her misfortunes. Several projects were formed for placing her on the English throne, so that she was kept under confinement in the reign of queen Elizabeth. At the beginning of that of James, a conspiracy, or rather a project of a conspiracy, was formed to raise her to the crown. She was first cousin to the king, being the daughter of a younger brother, which shews how rash the project was, supposing it to have been real; because James did not ascend the throne of England by the right of his father but that of his mother, consequently Arabella, though of the Stuart family, stood in a very remote degree of relation to the late queen Mary, had no claim to the crown of England, and the more so, as James had three children. The authors of this conspiracy were lords Grey, Cobham, sir Walter Raleigh, and others, who were tried, convicted, and condemned, but none were executed at the time, except a brother of lord Cobham, and two priests. The others were remanded to the Tower. (See RALEIGH). Arabella died in the year 1615, in prison, to which place she had been committed some time before, for having contracted marriage, without the knowledge of the crown, with William Seymour, grandson to the earl of Hertford. Hume. *Acta Regia*.

SEYMOUR'S Canal, in *Geography*, an inlet on the S.E. coast of Admiralty Island, extending from Point Hugh, about 28 miles N.N.W. of the entrance between Point Hugh and Point Gambier.

SEYMS, among *Farriers*. See SEAMS.

SEYNE, in *Geography*, a town of France, in the department of the Lower Alps, and chief place of a canton, in the district of Digne; 15 miles N. of Digne. The place contains 2557, and the canton 5227 inhabitants, on a territory of 307½ kilometres, in 8 communes.

SEYNEY, a town of Lithuania; 38 miles N.N.W. of Grodno.

SEYPOUR, a town of Hindoostan, in Oude; 40 miles N.E. of Fyzabad.

SEYSSSEL, CLAUDE DE, in *Biography*, an historical and political writer, who flourished in the beginning of the sixteenth century, was brought up to the law, which he practised with great applause at Turin. He obtained the places of master of requests and counsellor under Lewis XII. of France. He attended in the name of that prince at the council

council of Lateran, and was promoted to the bishopric of Marseilles in 1510, and to the archbishopric of Turin in 1517. He died in 1520, leaving behind him a great number of works, on theological, juridical, and historical subjects. He also translated into the French language Eusebius's Ecclesiastical History, Thucydides, Appian, Diodorus, Xenophon, Justin, and Seneca. He is said to have been the first who alleged the Salic law as influencing the succession to the crown of France. His "*Grand Monarchie de France*," published in 1519, and translated by Sleidan into the Latin language, maintains that the French constitution is a mixed monarchy, and that the king is dependent on the parliament. In his "*Histoire de Louis XII. Père du Peuple*," he is the perpetual panegyrist of that prince, but gives some curious facts respecting the reign of Lewis XI., whose vices are exposed by way of contrast.

SEYSEL, in *Geography*, a town of France, in the department of the Ain, and chief place of a canton, in the district of Belley, seated on the Rhone, which here becomes navigable, and divides it into two parts; 13 miles N. of Belley. The place contains 2260, and the canton 6032 inhabitants, on a territory of 122½ kilometres, in 5 communes.

SEZANE, or CEZANE, a town of France, in the department of the Po, on the Dora; 7 miles E. of Briançon.

SEZANNES, a town of France, in the department of the Marne, and chief place of a canton, in the district of Epernay; 45 miles W. of Vitry le Français. The place contains 4149, and the canton 12,203 inhabitants, on a territory of 300 kilometres, in 27 communes. N. lat. 48° 42'. E. long. 3° 48'.

SEZARNIK, a town of Hungary; 4 miles W. of Kapfdorf.

SEZENEVA, a town of Russia, in the government of Viatka; 16 miles N.N.E. of Glazov.

SEZULFE, a town of Portugal, in the province of Tras los Montes; 7 miles N.E. of Mirandela.

SEZZA, a town of the Campagna di Roma; 35 miles E.S.E. of Roma.—Also, a town of Naples, in Lavora, the see of a bishop, suffragan of Capua; 29 miles N.N.W. of Naples. N. lat. 41° 19'. E. long. 13° 34'.

SFACCIA, a town of European Turkey, in Albania; 8 miles N. of Dulcigno.

SFACHIA. See SPACHIA.

SFALASSA, a river of Naples, which runs into the sea; 4 miles E. of Cape Sciglio.

SFASACA, a town of Japan, on the S.W. coast of Nippon; 18 miles E. of Amanguchi.

SFAX, or *El Sfakusse*, a town of Africa, in the kingdom of Tunis, surrounded with walls. The trade of the inhabitants in oil and cloth is considerable; 45 miles S.E. of Cairoan. N. lat. 34° 49'. E. long. 10° 56'.

SFORZA, GIACOMUZZO, in *Biography*, named also Attendolo, founder of the illustrious house of Sforza, was born in 1369 at Cotignola, in Romagna. He is said to have been originally a peasant, and, according to a traditionary report, being one day at work, he was solicited to enlist for a soldier, when throwing his spade on a tree, he said he would enter if the spade did not fall down again, which proving to be the case, he immediately engaged in that military life which rendered him famous. He first served under general Alberic de Barbiano, and had for his comrade in arms the celebrated Braccio. These, in the early part of their career, were as intimate as brothers, but as they advanced in the profession, jealousy intervened, and they became at length such determined enemies, that when one engaged in the service of a prince or state, it was a sufficient motive for the other to engage on the opposite side. Sforza was soon distinguished

for his bravery, and for a disposition to seize by force whatever booty fell in his way. Braccio and he perfectly agreed in selling their services as dearly as possible, and in considering war as a trade which was to be kept up for their benefit. From the command of 100 men he rose to that of 7000: he obtained the office of gonfalonier to the holy see, and by pope John XXIII. he was created count Cotignola, an honour that was given by way of payment of a sum of money due to him. He commanded in the kingdom of Naples against Alphonso of Aragon, and was made constable of the kingdom. In marching to the relief of Aquila, he was drowned in the passage of the river Aterno or Pescara, in the year 1424. He is represented to have been robust in body, and when elevated to his highest rank, that he preserved the peasant's disregard of luxury, and frankness of manners.

SFORZA, FRANCESCO, first duke of Milan of that family, natural son of the preceding, was born in 1401. In 1421 he was viceroy to Louis, duke of Anjou, who had been adopted by queen Joan II. of Naples, and in 1424 he defeated the troops of Braccio; but his father, as we have seen, being drowned, he could make no advantage of his success. Although an illegitimate son, Joan conferred upon him all his father's estates, and he served successfully against the Aragonese commanders. He afterwards entered into the service of the duke of Milan, and defeated a fleet of the Venetians in the Po, in 1431. After the death of the queen, in 1435, he attached himself to her heir, René, duke of Anjou, and made himself master of several places in the Marche of Ancona. He even seized some of the pope's possessions, which brought on him an excommunication from Eugenius IV. whom he had formerly served. He had long wished to marry Bianca, the natural daughter of Philip-Maria Visconti, duke of Milan, and being in the Venetian service against that prince, he gained such advantages as induced Philip, who had often deceived him, to enter into a treaty in 1441, by which he made peace with the Venetians, and gave his daughter to Sforza, with Cremona and its territory for her portion.

The father and son-in-law did not long continue united, and Sforza commanded, as general, the troops of the pope, Venetians, and Florentines, in a war against Philip. He was, however, at length, induced to go over to the party of the duke of Milan, who, in 1447, died without legitimate issue. Sforza was now ambitious of succeeding him, and took a commission, as general of the troops of Milan, against the Venetians. But he soon made a treaty with the latter, and then led an allied army to the gates of Milan, to which he laid siege. The distress of the city occasioned a popular commotion, the leaders of which proposed the electing of Sforza for their duke. The majority concurred in the proposal, and in February 1450 he was received with great acclamations in that quality. Sforza remained in possession of the duchy, and in 1464 made himself master of Genoa, Lewis XI. of France having made over to him all the right of France to that city. Sforza died in 1466, and transmitted the sovereignty to his son. He had shewn himself a brave and skilful commander; but with several traits of grandeur in his character, he was not a man of principle, and was ready to change sides as suited his interest. Mod. Univ. Hist.

SFORZA, CATHERINE, an heroine of the same family, the natural daughter of Galeazzo Sforza, duke of Milan, who was assassinated in 1476. She married Jerome Riario, lord of Forli and of Imola, which was her own dowry; but she was left a widow at the age of twenty-two, with several children. In 1500 Forli was besieged by the duke of Valentino, son of pope Alexander VI. but she defended
the

the fortrefs with the greateft bravery, though the befiegers threatened to put her children to death, who were in their hands. At length the place was taken, and Catherine fent prifoner to Rome, but fhe foon recovered her liberty, and was married to John de Medicis, to whose family fhe rendered very eminent fervices.

SFORZA, ISABELLA, an ingenious lady of the fame family in the fixteenth century. Her letters were printed at Venice in 1549, by Hortenfio Laudo.

SFRONDATI, FRANCIS, a fenator of Milan, and counfellor of ftate to the emperor Charles V. On the death of his wife he entered into orders, and was elevated to the cardinalfhip. He died in 1550, aged 56. A poem of his, on the "Rape of Helen," was printed at Venice in 1559. His fon Nicholas became pope by the name of Gregory XIV : there was another cardinal of this name and family, who wrote feveral works againft the liberties of the Gallican church. He died in 1696.

SFUGGITO, Ital. in *Mufic*, to fhun, avoid, go out at the common way : as *cadenza sfuggita*, a difappointed cadence. This happens when the bafe feems preparing for a full clofe ; inftead of falling a 5th or rifing a 4th, it rifes only one tone or femitone, or falls a 3d ; or in other words, when all the parts avoid their natural and expected conclusion.

SFUMBERG, in *Geography*, a town of Bohemia, in the circle of Chrudim ; 5 miles S.S.E. of Chrudim.

SGIGATA, SGZGATA, or *Stora*, a town of Africa, in the country of Algiers, anciently called Rusicada ; fituated near the coaft of the Mediterranean. A few cifterns are the only remains of its ancient fplendour ; 30 miles W. of Bona. N. lat. $36^{\circ} 48'$. E. long. $6^{\circ} 40'$.

SGIGATCHEE, or SHIGATCHEE *Jeung*, a town of Thibet, fituated in a narrow valley, on a ridge of rock, fo as to command the road near the river Painom-tchieu ; 130 miles W.S.W. of Laffa. N. lat. $29^{\circ} 5'$. E. long. $88^{\circ} 52'$.

SGRAFFIT, SGRAFFIATA, in *Painting*. See SCRATCH-WORK.

SHAAB *al Yadayn*, in *Geography*, a dry fhelf in the Red fea, extending from N.E. by E., deriving its name from its fupposed refemblance to two arms wide open with their hands, fituated at the end of a great bay, far out to fea. There is a fecure harbour on the fide towards the land.

SHAAL STONE, in *Mineralogy*. See TABULAR SPAR.

SHAB, in *Agriculture*, a difeafe of fheep. See SCAB.

SHAB, or *Sheb*, in *Geography*, a town of Africa, in the county of Nubia ; 400 miles S.S.W. of Cairo. N. lat. $23^{\circ} 35'$. E. long. $30^{\circ} 30'$.

SHABADPOUR, a town of Hindooftan, in Oude ; 50 miles W. of Kairabad.

SHABALA, a name of a wonderful boon-granting cow, often fpoken of in Hindoo romance ; but more commonly under the name of *Surabhi* ; which fee.

SHABALEG, in *Geography*, a mountain of Turkeftan ; 70 miles N.N.E. of Toncat.

SHABAMOUSHWAN LAKE, a lake of Canada ; 210 miles N.N.W. of Quebec. N. lat. $49^{\circ} 10'$. W. long. 75° .

SHABAT, a town of the kingdom of Charafm ; 95 miles S.S.E. of Urgheuz.

SHABAYAGAN, a river of Canada, which runs into lake Michigan, N. lat. $48^{\circ} 30'$. W. long. $86^{\circ} 45'$.

SHABAZPOUR, a town of Hindooftan, in Allahabad ; 16 miles S.E. of Corah.

SHABRAN, a town of Perfia, in the province of Schirvan ; 40 miles N.E. of Schamachie.

SHABUR, a town of Perfia, in the province of Irak ; 6 miles S.W. of Cafbin.—Also, a town of Egypt, on the weft branch of the Nile, thought to be the ancient Andropolis ; 50 miles N.N.W. of Cairo. N. lat. $30^{\circ} 47'$. E. long. 31° .

SHACK, in *Ancient Customs*, a liberty of winter-pafturage. In the counties of Norfolk and Suffolk, the lord of the manor has shack, i. e. a liberty of feeding his fheep at pleafure, in his tenants' lands, during the fix winter months.

In Norfolk, shack alfo extends to the common for hogs, in all men's grounds, from the end of harveft till feeding-time. Whence to go a shack, is to feed at large.

SHACK, in *Agriculture*, provincially to fhed as grain at harveft. See HARVESTING Grain.

SHACK, or *Shack-corn*, a provincial term applied to the wafte corn left in the fields at harveft : alfo the flock turned upon the stubble after harveft, and likewise to fuch grounds as lie open to common fields. Pigs are the flock ufually employed in gathering this, and in fome parts flocks of geefe and turkies. Where pigs are clovered through the fummer, they are finifhed with the shacks and the acorns ; but fome farmers are fo improvident, as neither to feed their clovers in that advantageous way, nor even keep pigs enough to pick up the wafte corn, which is fometimes abfolutely fuffered to rot in the fields. Young pigs answer well in this ufe, as they thrive greatly, efpecially when bred upon the farm.

SHACK-Fork, provincially a wooden fork for shaking ftraw off the barn-floor, made of forked willow, &c.

SHACKLEFORD, in *Geography*, a poft-town of America, in Virginia ; 143 miles W.S.W. of Washington.

SHACKLES, in *Ship-Building*, the fmall ring-bolts driven through the ports, or fcuttles, and through which the lafhings or an iron hook paffes when the ports are barred in. There are alfo shackles put upon billow-bolts, for confining feamen, &c. who have deferved corporal punifhment.

SHACORA, in *Geography*, a town of Egypt, on the coaft of the Red fea ; 65 miles S. of El Cofeir.

SHAD, ALAUSA, in *Ichthyology*, the name of a fea-fifh, called alfo the *mother of herrings*, and by fome authors *clupea* and *triffa*, by the ancients *trichis*, or *trichias*, and the *clupea alofa* of Linnæus. See CLUPEA.

It very much refembles the herring in its general form, but it is flatter and broader, and grows to a cubit long, and four inches broad. The head fopes down confiderably from the back, which at the beginning is very convex, and rather fharp ; the body from thence grows gradually lefs towards the tail ; the under jaw is rather longer than the upper ; the teeth very minute ; the dorsal fin is placed very near the centre, is fmall, and the middle rays are the longeft ; the pectoral and ventral fins are fmall ; the tail very forked ; the belly extremely fharp, and ftrongly ferrated ; the back is of a dufky blue ; above the gills begins a line of dark fots, which mark the upper part of the back on each fide ; the number of thefe fots is different in different fifh, from four to ten.

It is very common in many feas, and in fome of our large rivers which lie near the fea. They run up thefe in great numbers, and are then very fat ; they afterwards become lean, and then go down to the fea again. They ufually fwim in large fhoals together.

In Great Britain the Severn affords the fhad in higher perfection than any other river ; where it firft appears in May, but in very warm feafons in April, and continues about

about two months. The shad at its first appearance, especially near Gloucester, is esteemed a very delicate fish, and sells dearer than salmon. The London fishmongers distinguish it from that of the Thames, by the French name of *aloise*. Whether they spawn in the Severn or Wye is not determined, as their fry has not yet been ascertained. The old fish come from the sea in full roe. The fishermen erroneously imagine that the bleak, which appears in multitudes near Gloucester in July and August, are the fry of the shad. Many of these are taken in those months only, but none of the emaciated shads are ever caught in their return. The Thames shad does not frequent that river till the month of July, and is esteemed a very insipid coarse fish. About the same time, the *twait*, a variety of the shad, makes its appearance near Gloucester, and is taken in great numbers in the Severn, but held in as great disrepute as the shad of the Thames. The true shad weighs sometimes eight pounds, but their general size is from four to five. The *twait*, on the contrary, weighs from half a pound to two pounds, which it never exceeds. The *twait* differs from a small shad only in having one or more round black spots on the sides; if only one, it is always near the gill, but commonly there are three or four, placed one under the other. Pennant.

No shad is to be taken in the Thames or Medway, except from May 10 to June 30. 39 Geo. II. cap. 21.

SHADDOCK, in *Botany*. See CITRUS.

SHADE, in *Agriculture*, any sort of protection employed for preventing the heat, cold, and rain, from affecting and injuring any kind of stock, whether of the nature of building or plantation, of the woody kind, &c. See SCREEN-Plantation, and SHELTER.

SHADE, in *Gardening*, any thing that intervenes to obscure or protect plants from the rays of the sun. It is effected in various ways by the gardener; as by mats, covers, &c.

SHADE, provincially a shed for fuel, or house for sheltering live-flock, &c.; it also signifies to shed as grain, as used in some places.

SHADE Mountain, in *Geography*, a mountain of Pennsylvania, N.E. of Lewistown.

SHADENDORFF, a town of Austria; 4 miles N.E. of Brugg.

SHADING of Plants, in *Gardening*, the art of protecting plants of young and tender growths in feed-beds, &c. from the sun. It is a necessary work on many occasions, in warm, dry, sunny weather in spring and summer, &c. in pricking out various sorts of small young plants from feed-beds, into nursery-beds, pots, &c. as well as small cuttings, slips, above-ground off-sets, pipings, &c. as likewise occasionally in transplanting any kind of more advanced plants, flowers, &c. into beds, or pots, in a hot, dry season; and sometimes to feed-beds of particular sorts of small or curious seeds, in hot sunny days; also to plants in hot-beds, under frames and glasses, both of young and more advanced growths. It is the most commodiously and effectually performed by garden mats in a sort of awning over the beds, to plants in the full ground, or to those in pots placed close together, or sometimes to feed-beds, either in that way, or by being spread on the surface; in the latter method, being occasionally watered over the mats: or sometimes, in hot dry weather, by some loose straw litter strewed over feed-beds, which by screening the surface from the parching sun, and preserving the moisture in the earth, promotes a more quick, regular, and free germination in the seed; and when the plants are come up, the covering is soon drawn off lightly with a wooden or other rake. To plants under

glasses in frames, &c. the occasional shading is effected either by mats spread thinly over the glasses, or sometimes by a little loose, long litter, shaken lightly over them, just during the fierce heat of the sun. In all cases the shade should not be made too thick, so as to darken the plants too much.

Also in the business of occasional shading, it is in general only to be continued in the warmest time of sunny days, generally longer to plants, cuttings, &c. which have not struck root, than those that are in a growing state; and in common with all plants in the full ground, or others designed for placing in the open air, where occasional shading is necessary, it should be discontinued on evenings, mornings, and nights, that they may enjoy the benefit of the full fresh air at these times; as also the tender sorts, striking or advancing in growth under glasses, having occasional shading when the sun is powerful, in the warmer part of the day, should remain unshaded before and after that time, that they may receive the necessary beneficial influence of light and air in a proper degree. But in plants, cuttings, slips, &c. that have had occasional shading till they have struck good root, and begin to advance a little in a renewed growth, the shading should be mostly discontinued gradually, especially for those in beds, pots, &c. in the open ground, or others designed for transplantation, or for placing in pots, in the full air for the summer, according to their kinds: but in some small tender plants of slender growth, the occasional shading may probably be necessary in longer continuation, as till they acquire more strength; and to plants remaining all summer in hot-beds, or under frames and glasses, the continuance of occasional moderate shading in hot sunny days will be proper; but in most young plants, cuttings, &c. pricked out or planted as above, and designed for the full ground or open air, not continued under glasses, the having the benefit of occasional shade till well struck is all they require.

The sorts of plants which require this kind of management are very numerous; but it is constantly mentioned in their culture where necessary.

SHADMAN, in *Geography*, a town of Grand Bucharia; 36 miles N.N.E. of Termed.

SHADOW, SHADE, in *Optics*, a certain space deprived of light, or where the light is weakened by the interposition of some opaque body before the luminary.

The doctrine of shadows makes a considerable article in optics, astronomy, and geography; and is the general foundation of dialling.

As nothing is seen but by light, a mere shadow is invisible: when, therefore, we say, we see a shadow, we mean partly, that we see bodies placed in the shadow, and illuminated by light reflected from collateral bodies; and partly, that we see the confines of the light.

If the opaque body, that projects the shadow, be perpendicular to the horizon, and the plane it is projected on be horizontal, the shadow is called a *right* shadow. Such are the shadows of men, trees, buildings, mountains, &c. If the opaque body be placed parallel to the horizon, the shadow is called a *verged* shadow; as the arms of a man stretched out, &c.

SHADOWS from opaque Bodies, *Laws of the Projection of*.

1. Every opaque body projects a shadow in the same direction with the rays of light; that is, towards the part opposite to the light. Hence, as either the luminary or the body changes place, the shadow likewise changes its place.
2. Every opaque body projects as many shadows, as there are luminaries to enlighten it.
3. As the light of the luminary is more intense, the shadow

SHADOW.

dow is the deeper. Hence, the intensity of the shadow is measured by the degrees of light that space is deprived of. In reality, the shadow itself is not deeper, but it appears so, because the surrounding bodies are more intensely illuminated.

4. If a luminous sphere be equal to an opaque one, which it illumines, the shadow this latter projects will be a cylinder; and, of consequence, will be propagated still equal to itself, at whatever distance it extends; so that, if it be cut in any place, the plane of the section will be a circle equal to a great circle of the opaque sphere.

5. If the luminous sphere be greater than the opaque one, the shadow will be conical. If, therefore, the shadow be cut by a plane parallel to the base, the plane of the section will be a circle; and that so much the less as it is at a greater distance from the base.

6. If the luminous sphere be less than the opaque one, the shadow will be a truncated cone: consequently it grows still wider and wider; and therefore, if cut by a plane parallel to its base, that plane will be a circle so much the greater as it is farther from the base.

7. To find the length of the shadow, or the axis of the shady cone, projected by a less opaque sphere, illumined by a larger; the semidiameters of the two, as CG and IM , (*Plate XX. Optics, fig. 1.*) and the distances between their centres GM , being given:

Draw FM parallel to CH ; then will $IM = CF$; and therefore FG will be the difference of the semidiameters GC and IM . Consequently, as FG , the difference of the semidiameters, is to GM , the distance of the centres; so is CF , or IM , the diameter of the opaque sphere, to MH , the distance of the vertex of the shady cone, from the centre of the opaque sphere. If then, the ratio of PM to MH be very small, so that MH and PH do not differ very considerably, HM may be taken for the axis of the shadowy cone: otherwise the part PM must be subtracted from it, to find which, seek the arc LK , which is the measure of the angle LMK , or MHI , and this angle is one of the angles of the right-angled triangle MHI , the sides of which, MI and MH , are known; for this, subtracted from a quadrant, leaves the arc IQ , which is the measure of the angle IMP . Since then, in the triangle MIP , which is rectangular at P , besides the angle IMQ , we have the side IM ; the side MP is easily found by plain trigonometry.

E.g. If the semidiameter of the earth be $MI = 1$; the semidiameter of the sun will be $= 117$; and therefore $GF = 111$; and of consequence $MH = 217$; since then MP is found by calculation to bear a very small ratio to MH ; for the angle $MIP = KML$, may be taken equal to the apparent semidiameter of the sun, because of the sun's great distance, and its considerable magnitude, in proportion to the globe M ; and therefore, $MP : MI :: \text{fine of } 16' : \text{radius, i.e.} :: 217 : 1$, nearly; and as MH is about 217 times MI , PM may be neglected, and PH may be taken to be 217 semidiameters of the earth. See *ECLIPSE of the Moon*.

Hence, as the ratio of the distance of the opaque body, from the luminous body GM , to the length of the shadow MH , is constant; if the distance be diminished, the length of the shadow must be diminished likewise. Consequently, the shadow continually decreases as the opaque body approaches the luminary.

8. To find the length of the shadow projected by an opaque body TS (*fig. 2.*); the altitude of the luminary, *e. gr.* of the sun above the horizon, *viz.* the angle SVT , and that of the body, being given. Since, in the rectangled

triangle STV , which is rectangular at T , we have given the angle V , and the side TS ; the length of the shadow TV is had by trigonometry.

Thus, suppose the altitude of the sun $37^\circ 45'$, and the altitude of a tower 178 feet; TV will be found 230 feet nearly.

9. The length of the shadow TV , and the height of the opaque body TS , being given; to find the altitude of the sun above the horizon.

Since, in the rectangled triangle STV , rectangular at T , the sides TV and TS are given; the angle V is found thus: as the length of the shadow TV , is to the altitude of the opaque body TS , so is the whole sine to the tangent of the sun's altitude above the horizon. Thus, if TS be 30 feet, and TV 45, TVS will be found $41^\circ 49'$.

10. If the altitude of the luminary, *e. gr.* the sun above the horizon TVS , be 45° , the length of the shadow TV is equal to the height of the opaque body, the triangle in this case being isosceles.

11. The length of the shadows TZ and TV of the same opaque body TS , in different altitudes of the luminary, are as the co-tangents of these altitudes.

Hence, as the co-tangent of a greater angle is less than that of a less angle; as the luminary rises higher, the shadow decreases; whence it is, that the meridian shadows are longer in winter than in summer.

12. To measure the altitude of any object, *e. gr.* a tower AB (*fig. 3.*) by means of its shadow projected on an horizontal plane.

At the extremity of the shadow of the tower C , fix a stick, and measure the length of the shadow AC ; fix another stick in the ground of a known altitude DE , and measure the length of the shadow thereof EF . Then as EF is to AC , so is DE to AB . If, therefore, AC be 45 yards, ED 5 yards, and EF 7 yards; AB will be $32\frac{1}{2}$ yards.

13. The right shadow is to the height of the opaque body, as the cosine of the height of the luminary to the sine.

14. The altitude of the luminary being the same in both cases, the opaque body AC (*fig. 4.*) will be to the versed shadow AD , as the right shadow EB to its opaque body DB . Hence, 1. The opaque body is to its versed shadow, as the cosine of the altitude of the luminary to its sine; consequently the versed shadow AD is to its opaque body AC , as the sine of the altitude of the luminary to its cosine.

2. If $DB = AC$; then will DB be a mean proportional between EB and AD ; that is, the length of the opaque body is a mean proportional between its right shadow and versed shadow, under the same altitude of the luminary.

3. When the angle C is 45° , the sine and cosine are equal; and, therefore, the versed shadow is equal to the length of the opaque body.

15. A right sine is to a versed sine of the same opaque body, under the same altitude of the luminary, in a duplicate ratio of the cosine to the sine of the altitude of the luminary.

Right and versed shadows are of considerable use in measuring: as by their means we can commodiously enough measure altitudes, both accessible and inaccessible, and that too when the body does not project any shadow. The right shadows we use, when the shadow does not exceed the altitude; and the versed shadows, when the shadow is greater than the altitude. On this footing is made an instrument called the *quadrat*, or *line of shadows*; by means of which the ratios of the right and versed shadow of any object, at any altitude, are determined. This instrument is usually

SHADOW.

usually added on the face of the quadrat. Its description and use, see under *QUADRAT*, and *ALTITUDE*.

SHADOWS, *The Doctrine of*, in *Perspective*, is the theory and practice of representing shadows, as projected from a given point at a finite distance, such as a candle, or as projected from the sun, where the distance, though not infinite, is, for the sake of simplicity, considered as such, in order that the rays may be all parallel; or otherwise, for this purpose, the rays may be supposed as proceeding from all points of space in parallel lines.

A line of shade is the line deprived of light by an opaque point opposed to the luminary.

A plane of shade is an opaque or dark plane, occasioned by the privation of light from the interposition of a straight line opposed to the luminary; and hence it is evident, that every plane of shade will pass through the luminary.

To find the shadows upon the surfaces of bodies occasioned by the privation of the sun's rays.

Given the vanishing line of a plane, the vanishing point of the sun's rays, the vanishing point of the seat of a ray on the plane, the representation of a point in space, and the representation of the seat of the point in the plane whose vanishing line is given; to find the representation of the shadow upon the plane of the picture.

Join the vanishing point of the line to the vanishing point of lines perpendicular to the plane, whose vanishing line is given, and you will thus obtain the vanishing line of another plane, in which is the original of the seat of the point, and the original of the line in projection; and therefore the intersection of the vanishing line given of the plane on which the seat of the line required to be drawn and the vanishing line found is the vanishing point of the seat of the line. Therefore, draw a straight line through the seat of the point given in projection to the vanishing point found, and the line thus drawn will be the whole representation of the seat.

This proposition is evident, since the vanishing line of every plane perpendicular to the plane whose vanishing line is given, will pass through the vanishing point of lines perpendicular to that plane; and since the seat of the original line, on the original of the plane given, is formed by a plane passing through the original line perpendicular to the given plane intersecting therewith; therefore the vanishing line of this perpendicular plane will pass through the vanishing point of lines perpendicular to the original of the plane given; but when two points in a vanishing line are given, the whole of the vanishing line is given, being the straight line passing through these points.

A general knowledge of the shadows of lines upon planes in any position ought first to be acquired; but as the relation of lines and planes to the horizon is generally given, it will be necessary to find the relation of these lines and planes to one another; and here it will be proper to observe, that whatever be the number of planes, the vanishing point of the sun's rays will remain unchangeable, or in the same position in respect of the first vanishing line, and will be common to all the different planes; but every different plane will have its own vanishing point for the seat of the sun's rays in that plane, and that vanishing point will be in the vanishing line of that plane. As vertical and horizontal planes occur most frequently in practice, these will require particular attention.

Given the inclination of a plane to the plane of the picture, both being perpendicular to the original plane, and the seat and inclination of a straight line in the plane of the horizon; to determine the vanishing point of the seat of the line on the vertical plane, and the vanishing point of the line.

VOL. XXXII.

Let the scheme, N° 1. (*Plate I. Shadows, fig. 1.*) represent the vanishing plane, and N° 2. the plane of the picture.

In the vanishing plane, N° 1, let $v l$ be the vanishing line, e the point of sight or place of the eye, AB the intersection of the original vertical plane, inclined to the plane of the picture in the angle Agl . Let AD be the seat of the line, as given in position, to the horizon: make the angle DAF equal to the inclination of the line to the plane of the horizon; draw DF perpendicular to AD , and DB perpendicular to AB ; produce DB to K ; make BK equal to DF , and join AK , which is the seat of the line on the vertical plane. Draw el parallel to AB , and draw lh perpendicular to vl : in vl , make lm equal to le , and make the angle lmh equal to BAK , and h will be the vanishing point of the seat of the line. Draw ev parallel to DA , and vi perpendicular to vl : make vn , in the vanishing line, equal to ve ; make the angle vni equal to the angle DAF , which the original line makes with the plane of the horizon. Draw $e \odot$ perpendicular to vl , meeting vl in \odot .

In the plane of the picture N° 2, let VL be the vanishing line answering to vl , N° 1: in VL make choice of any convenient point, \odot , for the centre of the picture: make $\odot L$ equal to ol , N° 1, and $\odot V$ equal to ov , N° 1: draw LH and VI perpendicular to VL , then H is the vanishing point of the seat of the line, and I the vanishing point of the line itself.

The points H and I will be both on the same side of the vanishing line of the horizontal planes.

This problem is the same when the seat and altitude of a ray of the sun are given, and the inclination of a vertical plane to the plane of the picture; to find the vanishing point of a ray of light, and the vanishing point of the seat of the sun's rays.

When the sun is on the same side of the picture with the spectator, the vanishing point of the seat of the rays, and the vanishing point of the rays, will be below the vanishing line VL ; but when on the other side of the picture, the vanishing point of the rays and the vanishing point of their seat will be above VL .

The following problem unites that of finding the vanishing points of the seat of a line, and the vanishing point of the line itself, with the vanishing point of the seat of the sun's rays and the vanishing point of the rays, as relating to the plane given.

Given the inclination of a plane to the plane of the picture, both being perpendicular to the original plane, the seat and inclination of a straight line, and the seat and inclination of the sun's rays, both to the plane of the horizon; to determine the vanishing point of the seat of the sun's rays, the vanishing point of the seat of the line on the vertical plane, as also the vanishing point of the sun's rays and vanishing point of the line itself.

It is evident, that the vanishing point of the seat of the sun's rays, and the vanishing point of the seat of the line, are both in the vanishing line of the plane, which is a straight line perpendicular to the vanishing line of the horizon; since the original of the seat of a ray, and the original of the seat of the line, are both in the original plane: and if the line be parallel to the original plane, the vanishing point of the seat of the line will be in the intersection of the vanishing line of the vertical plane with that of the horizon.

Join VS , (*fig. 2.*) and let it meet AB in s ; draw bs and aS , cutting each other in c , and bc is the shadow of the line required.

For the vanishing point of the line that projects the shadow and the vanishing point of the sun's rays, are in the vanishing

vanishing line of the plane of shade; and because the plane of shade is supposed to cut the original plane, the intersection, which is the shadow, will be a line in the original plane, and therefore the vanishing point of the shadow will be in the vanishing line of the original plane; and as it has been shewn that it is also in the plane of shade, it will therefore be in the intersection of the plane of shade, and the vanishing line of the plane on which the shadow is thrown.

This problem is general for planes and lines in all situations, but in the following examples the centre and distance of the picture are supposed to be given, and the position of the picture is that of being perpendicular to the primary plane or first original plane: the objects themselves are solids, whose edges or planes are supposed to be perpendicular to the plane on which they stand. As oblique positions very seldom occur in practice, we shall suppose the vanishing line of the original plane, on which the object is placed, to be given.

To find the shadow of a prism placed on the primary plane.

Let *AB* (figs. 3, 4, and 5.) be the vanishing line of the plane of the base, and since the picture is supposed to be perpendicular to the primary plane, the vanishing line of the plane of shade, occasioned by the vertical lines which form the concurrence of the sides of the object, will be perpendicular to the vanishing line *AB*. Let *S*, therefore, be the vanishing line of a plane of shade, occasioned by any line of concurrence, *S* being the vanishing point of the sun's rays, and *s* the intersection of the vanishing line of the plane of shade, with that of the plane on which the shadow is to be thrown.

Let *gd*, *ba*, *mn*, be the edges of the solid; join *bs* and *aS*, cutting each other in *c*; and *bc* is the shadow, occasioned by the edge or line of concurrence *ba*. Draw *cB* and *dS*, cutting each other in *e*; or, if necessary, produce them to cut in *e*, and *ce* is the shadow, occasioned by the edge *ad*, parallel to the plane of the original plane; also draw *eA* and *Sf*, cutting each other in *i*; or, if necessary, produce them to cut each other in *i*, then *ei* will be the shadow of the edge *df*. Lastly, draw *is*, which will complete the shadow of the prism, as required.

Fig. 3. shews the shadows of the object when the sun is before the picture; fig. 4. shews the shadow when the sun is behind the picture; and fig. 5. when the sun is in the plane of the picture.

To find the shadow of a building with a break. Let *VL* (fig. 6.) be the vanishing line of the horizon, *V* the vanishing point of the horizontal lines, represented by *ac* and *bd*, that form the end of the building, also of *ef*, *gb*, which represent the horizontal lines forming the sides of the break. Let the sun be supposed to be in the plane of the picture, or its rays parallel thereto, and let the planes *abdc* and *egbf* be in shade, and the plane *egbf* will throw a shadow upon the plane *ablk*, and the plane *abdc* upon the horizon. As the sun's rays are parallel to the picture, they will have no vanishing point, but still the rule will hold in this case also. Through the vanishing point *L*, draw *LM* perpendicular to *VL*, then *LM* is the vanishing line of the plane *ablk*, on which the shadow is to be thrown; through *V* draw *VM* parallel to the sun's rays, or make the angle *LV* equal to the angle which the sun's rays make with the plane of the horizon. Thus *M* is the vanishing point of the shadow of all lines vanishing in *V*, upon the plane *ablk*: therefore, to find the shadow of the line *bg*, join *Mb*, and produce it to *m*; and draw *gm* parallel to *LV*, then *m* will be the shadow of the point *g*, and *bm* of *bg*. Draw *mn* parallel to *ge*, and *mn* will be the

shadow of *ge*: therefore *bmnf* will be the whole shadow of the plane *bgef*, upon the plane *ablk*.

To find the shadow of the end *abcd* upon the plane of the horizon: draw *ao* parallel to *LV*, and *bo* parallel to *MV*; then *ao* is the shadow of the vertical line *AB*: join *oV*, and draw *dp* parallel to *MV*, and *op* is the shadow of *bd*: join *pL*, and draw *rq* parallel to *MV*, and *pq* will be the shadow of the line *dr*, not seen: join *sq*, or draw it parallel to *LV*, then *ao pqs* will be the shadow of the building upon the plane of the horizon.

Many more examples of shadows might be given, but if the principles here shewn are understood, the artist will not be at a loss to find the shadow of any right-lined object whatever: for to find the shadow of an object constituted by planes, and consequently terminated by straight lines, is no more than to find the shadow of these lines. If a circle be given, the circumference may be divided by parallel lines into parts, and the shadows of the points of division may be found by finding the shadows of the intercepted lines, and drawing a curve round the extremities.

If it were required to find the shadows upon several planes, first find the shadow in the plane on which the object stands, and observe where the shadow meets the next plane; then having the vanishing line of this second plane, observe where the vanishing line of the plane of shade cuts the vanishing line of this second plane, then the point of intersection is the vanishing point of the shadow on the second plane.

The principles shewn under the article PROJECTION, will apply equally to the representation of objects in perspective, particularly where the planes which throw the shadow intersect the plane on which the shadow is to be thrown; for by continuing the line that throws the shadow, and the intersection of the plane to meet each other, you have the point where the shadow terminates; and therefore, if a point be given in the shadow, the direction of the shadow will be known. Thus in the last example, suppose the line *ao* obtained; and since the point *o* is the beginning of the shadow of the line *bd*, produce *ac* and *bd* to meet in *V*: join *oV*, and draw the ray of the sun *dp*, then *op* is the shadow of *bd*: produce *dr* and *cs* to meet in *L*, and join *pl*; draw the ray *rq* from *r*, then *pq* is the shadow of *dr*, not seen.

To find the vanishing line of a pole upon several planes.

Let *ABCDEFGHIK*, (Plate II. Shadows, fig. 1.) be the outline of a building, with a lean-to or pent-house *DENPQ*: *V* is the vanishing point of all horizontal lines, in the gable *ABLIK* of the main house, and also of the gable *DMQC* of the pent-house; *L'* is the vanishing point of all the horizontal lines in the parallel fronts *BFG* and *DENM*; and as all vertical planes have vertical vanishing lines, *VR* is the vanishing line of the parallel gables *ABLIK* and *CDMQ*; *LU* the vanishing line of the fronts *BFG* and *DENM*; *ILGH* is the representation of the roof of the main building, and *QMNP* that of the pent-house.

Produce *LI* to meet *VR*, its vanishing point, in *S*: draw *SL'*, which will be the vanishing line of the inclined plane *LGH*, for *S* and *L* are the vanishing points of two lines in that plane: produce *MQ* to meet *VR* in *T*, and draw *TL*; then *TL* is the vanishing line of the inclined plane *MNPQ* of the roof of the pent-house, because *T* and *L* are the vanishing points of two lines in that plane.

Let *WX* be a pole, resting upon the end of the house in the same plane with the gable *ABLIK*; and let \odot be the vanishing point of the sun's rays: produce the pole *XW* to meet *VR* in *R*, then *R* is the vanishing point of the pole, or of the line that throws the shadow: therefore by drawing $\odot R$, $\odot R$ will be the vanishing line of the plane of shade, which let cut *VI*, the vanishing line of the horizon, in *Y*; and

LU,

SHADOW.

L U, the vanishing line of the vertical planes B F G I and D E M N of the walls, in U; V R, the vanishing line of the gables, in R; S L, the vanishing line of the main roof, in Z; and T L', the vanishing line of the pent-house, in Z'. We are now prepared for drawing the shadow of the pole W X upon the horizontal plane and upon the building.

Produce A B to meet W X in X, then X will be the point where the pole rests upon the ground or horizontal plane: draw X Y, cutting D E in *a*; draw U *a*, cutting D M in *b*; draw *b* R, cutting M Q in *c*; draw *c* Z', cutting P Q in *d*; draw U *d*, cutting G I at I; and draw I Z, cutting the ridge I H at *f*; then X *a b c d e f* will be the whole shadow of the pole.

For, since the shadow first begins at the foot of the pole or line in the plane of the horizon, and since the intersection of the vanishing line of a plane on which the shadow is to be thrown, and the intersection of the vanishing line of the plane of shade, gives the vanishing line of the shadow upon that plane; now Y is the intersection of the vanishing line of the plane of shade with the vanishing line of the horizon; therefore Y is the vanishing point of the shadow of the line W X upon the plane of the horizon. The next plane on which the shadow is thrown is D E N M; now L U is the vanishing line of the plane D E N M, and U is the point where the vanishing line of the plane of shade cuts L' U; therefore U is the vanishing point of the shadow upon the plane D E N M. The next plane on which the shadow is projected is the plane C D M Q: now V R is the vanishing line of the plane C D M Q, and it intersects the vanishing line of the plane of shade in R; therefore R is the vanishing point of the shadow upon the plane C D M Q. The next surface on which the shadow is projected is the plane, M N P Q, of the roof of the pent-house: now Z' is the intersection of the vanishing line of the plane of shade with the vanishing line of the plane M N P Q; therefore Z' is the vanishing point of the shadow on the plane M N P Q. The next surface on which the shadow is projected is the plane B F G I of the wall; but U has already been shewn to be the vanishing point of the shadow. The plane of the roof is the last surface on which the shadow is projected: now S L is its vanishing line, and it meets the vanishing line of the plane of shade in Z, therefore Z is the vanishing point of the shadow upon the roof.

In carrying the shadow of a line across several planes, it will not be surprising if some little inaccuracy takes place from the obliquity of intersections: it might be a great chance, that when the part of the shadow *d I*, which falls upon the plane B F G I, is drawn from the vanishing point U, through the point *d*, that it will meet the pole at I, as it ought to do. To remedy this, begin with the shadow *I d*, and proceed in the reverse order, until it meets the line W X at X, which it must in principle, and will not be liable to vary much in practice.

The points which direct the shadows upon the several planes might also be found by the methods shewn in the article PROJECTION.

The following observations will be useful in the practice of shadows.

When a straight line that throws a shadow is parallel to the picture, it is then represented parallel to the original. In this case it has no vanishing point; or, in other words, the vanishing point of the line may be said to be at an infinite distance: and, therefore, instead of the vanishing point of the line being joined to the vanishing point of the sun's rays, draw a straight line from the vanishing point of the sun's rays parallel to the projection of the line which throws the shadow, which will be the vanishing line of the plane of

shade; and therefore the intersection of the vanishing line of the plane of shade with the vanishing line of the plane on which the shadow is to be thrown, will give the vanishing point of the shadow on that plane, after the same analogy as lines which are inclined to the picture. This case is similar to that of the sun's rays being parallel to the picture: for here also the vanishing point of the rays is at an infinite distance; but as the plane of shade will still have a vanishing line, this line will be found by drawing a straight line through the vanishing point of the line that throws the shadow parallel to the sun's rays, as already shewn in a former example.

Shadows projected from a given Point; as by the Light of a Candle or Lamp.—It is evident, if the representation of the luminous point be given, and its seat upon any plane, also the representation of any point in space, and its representation upon that plane, the shadow of the point will be found by drawing a straight line from the luminous point through the point in space, and by drawing another straight line from the seat of the luminous point through the seat of the point in space; and the intersection of the two lines thus drawn will represent the shadow of the point upon the plane. But when the relation of several planes represented in a picture, the representation of the light with its seat, and the representation of a point in space with its seat, are given, to project the shadow of the point on the other planes, other considerations become necessary.

For this purpose, let A B C D (*fig. 2.*) be the inside of a room, consisting internally of the vertical planes, A H, E I, F K, G C, and of the horizontal planes A E F G B and D H I K C: also, let L be the luminous point, and M its seat in the plane A E F G B. In order to form an idea of the point L, in respect of the other planes, it is necessary to have the intersection of a line drawn through L, in a given position with one of the planes. Thus, if it is known that the straight line L *a*, parallel to the picture, cuts the plane of the wall B K, in the point *a*; the position of the point L to any of the other planes may be easily determined, as follows.

Through *a* draw *a b* parallel to the vanishing line N O, of the plane B K, cutting B G, the intersection of the planes B K and A G, in *b*; through *b* draw *b M* parallel to P Q, the vanishing line of the floor, cutting A E, the intersection of the planes A G and A H, in *c*; also F E, the intersection of the planes A G and E I, in *d*. Draw *c e* parallel to N O, the vanishing line of the plane A H; and *d f* parallel to R S, the vanishing line of the plane E I. Then, because the intersecting and vanishing lines of any plane are parallel to each other, and because a line drawn parallel to the intersecting line is parallel to the picture; therefore the representations of all the lines, *a b*, *b c*, or *b d*, *c e*, and *e f*, are all parallel to the picture, and in a plane passing through the luminous point L.

Given the representation of any straight line T U, and the points V and W, where the lines T V and U W, drawn parallel to the picture and to each other, meet the plane A G, whose vanishing line, P Q, is given, to find the vanishing point, X, of the line T U.

Draw W V, cutting P Q, the vanishing line of the plane A G, in Y; and draw Y X parallel to T V or U W, meeting the line U T, produced in X, the vanishing point required.

To make this appear, it is evident that the vanishing line of a plane passing through W and V, must also pass through Y; and likewise the vanishing line of a plane passing through U W, must be parallel to it: wherefore Y X is the vanishing line of the plane, which passes through U W.

SHADOW.

Now let WY cut the plane AX in Z ; and in this example the vanishing line, YX , is parallel to the vanishing line of the plane EI : therefore the planes, represented by EI and $XUWY$, intersect each other in a line parallel to the picture; and, therefore, the representation of such an intersection is parallel to XY , or to RS , the vanishing line of the plane EI .

Given the vanishing lines, AB , CD , EF , (*fig. 3.*) of three planes, $GHIK$, $LMNO$, and $MNIQR$, the common intersection, NO , of the planes $GHIK$ and $LMNO$; also the intersections, NI and MN , of the planes $GHIK$ and $LMNO$, with the plane $MNIQR$; the representation, ab , of a line in the plane $LMNO$; the point of light, c ; cd , a line parallel to the picture; and d , the point where it intersects the plane $MNIQR$: to find the shadow of the line on the plane $GHIK$.

First, find the representation of a ray of light parallel to the picture, thus: draw de parallel to AB , cutting MN at e ; draw ef parallel to EF : then if ab be not parallel to ef , produce ba to f , and join fc , which is the ray required. Secondly, find the vanishing line of a plane of shade passing through the line ab , and the ray fc , thus: produce ab to meet CD in D , which is the vanishing point of ab ; through D draw DF parallel to fc , and DF will be the vanishing line of the plane required. And, lastly, find the shadow of AB upon the plane $GHIK$, thus: produce ON and ab to meet in g ; from F , through g , draw the line Fbi ; and from the point of light, c , draw cbb and cai ; then bi will be the shadow of the line, as required.

For de being parallel to AB , the vanishing line of the plane $MNIQR$, de will be parallel to the picture; and since ef is drawn parallel to EF , the vanishing line of the plane $LMNO$, ef will be parallel to the picture; and because ba meets ef in f , fc is a ray of light parallel to the picture, meeting the line ab ; and because CD is the vanishing line of the plane $LMNO$, and ab is in the plane $LMNO$, therefore the vanishing point of ab is in CD , and consequently at D , where ab produced meets CD : and because D is the vanishing point of ab , the vanishing line of the plane of shade will pass through D parallel to fc : but F is the intersection of the vanishing line of the plane of shade, with the vanishing line EF of the plane $GHIK$, on which the shadow is projected, therefore F is the vanishing point of the shadow on the plane $GHIK$; and because g is the intersection of ab with the plane $GHIK$, the shadow will commence at g , and consequently drawing $Fgbi$ gives the direction of the shadow; and lastly, because c is the luminous point, the rays cai and cbb will terminate the shadow.

As D would be the vanishing point of all lines parallel to the original of ab in the plane represented by $LMNO$; and as different representations could not meet the line ef in the same point, the ray cf will have different positions, and consequently DF , which is drawn parallel thereto; and as the point D is stationary, the point F will be variable.

Given the representation of three rectangular planes, forming a solid angle, the representation of a point of light or candle, and the seat of the light on one of the planes; to find the seat of the light on the other two planes.

Let the three planes be $ABCD$, $ABGF$, $AFED$, (*fig. 4.*) it is evident that every two adjoining planes have three edges parallel to each other, one common to both, which is their line of concurrence; these edges will therefore vanish in

a point or be parallel to each other, according as the original planes are oblique or parallel to the picture: let the original planes be obliquely situated; therefore produce the sides CD , BA , GF , of the two adjoining planes $ABCD$, $ABGF$, and they will all meet in V , their vanishing point; also produce the sides DE , AF , BG , of the two adjoining planes $DAFE$, $FABG$, and they will meet in W , their vanishing point; likewise produce the sides CB , DA , EF , and they will meet in X , their vanishing point.

Let L be a luminous point, and S its seat in the plane $ABCD$: draw SX , cutting AB in a ; draw aW , and draw LX , cutting aW in S' , then S' is the seat of the luminous point in the plane $ABGF$: draw SV , cutting AD in b ; draw bW , and LV , cutting each other in S'' , then S'' is the seat of the luminous point in the plane $ADEF$.

Because the plane $ABCD$ represents a rectangle, and V is the vanishing point of the one side, and X that of the other; all the lines drawn to X will represent right angles with the lines which vanish in V ; therefore Sa and AB represent a right angle in the plane $ABCD$. For the same reason, aS represents a right angle in the plane $ABGF$, and since the planes $ABGF$ and $ABCD$ are at right angles, the angle SaS' will represent a right angle; and because aS represents a perpendicular to AB , aS' and SL will represent parallel lines; and since LS' and Sa have the same vanishing point X , the original of LS' is parallel to the original of Sa ; but Sa represents a perpendicular to the plane $ABGF$, therefore LS' also represents a perpendicular to the plane $ABGF$; and because the point S' is in the plane $ABGF$, S' is the seat of the luminous point L , in the plane $ABGF$. In the same manner it may be shewn that S'' is the seat of the luminous point in the plane $ADEF$.

Given the representation ed of a line perpendicular to the original of the plane $ABCD$, and the vanishing point W of the line, and the point d , where the line meets the plane $ABCD$, a luminous point L , with its seat S , also upon the plane $ABCD$; to find the shadow of the line CD upon the said plane.

Draw Sd and Lc to meet each other in e , then de will be the shadow of the line cd , as required. In the same manner, if fg represent a line perpendicular to the plane $ABGF$, and g the point where it meets the plane $ABGF$, gb will be the shadow of the line, by drawing Lf and $S'g$ to meet in b .

This method is general for any position of the original planes, with respect to the picture; and this position of the planes, in respect of each other, is that which most frequently occurs in practice.

Let $ABCD$ (*fig. 5.*) be the inside of a room, shewing five sides, one, $EFGH$, being parallel to the picture, and the other four perpendicular to it; C' is the centre of the picture.

Let L be the light of a candle, S its seat upon the floor; then to find the seat of the light on all the other four sides. Through S draw ab parallel to VL' , the vanishing line of the horizon, cutting BF at a , and CG at b ; draw aS' and bS'' parallel to YZ , the vanishing line of the two vertical planes; through L , the point of light, draw $S'S''$, then S' is the seat of the light in the plane $ABFE$, and S'' the seat of the light in the plane $CDHG$. Produce CS to meet BC in c ; draw cd parallel to ZY , and join dC' ; draw SS^3 parallel to YZ ; then S^3 is the seat of the light in the plane $AEDH$; let CS cut the line FG in e ; draw eS^4 parallel to ZY , cutting LC' in S^4 , then S^4 will be the seat of the light on the plane $EFGH$. Then to project a prism standing perpendicular to any of these planes, suppose that

that which stands on the floor. From the feat *S* draw *S i*, meeting *C G* in *o*; draw *or* parallel to *Z Y*, and draw the ray *L m r*, and *r* will be the shadow of the point *m*; draw *S h*, cutting *C' G* in *p*; draw *p s* parallel to *Y Z*, and draw *L n*, cutting *p s* at *s*; then *s* is the shadow of the point *n*; also draw *S g*, meeting *C' G* in *q*; draw *q t* parallel to *Z Y*, and draw *L k*, meeting *q t* at *t*, then *t* is the shadow of the point *k*; join *r s* and *s t*, which complete the whole shadow of the prism upon the floor, and on the wall.

The principle of finding the shadows of the prisms on the other sides, is the same, and will be obvious to inspection. The truth of the method has already been shewn.

SHADOW, in *Geography*. The inhabitants of the globe are divided, with respect to their shadows, into *Ascii*, *Amphiscii*, *Heteroscii*, and *Periscii*.

SHADOW, in *Painting*, denotes an imitation of a real shadow, effected by gradually lightening and darkening the colours of such figures as by their disposition cannot receive any direct rays from the luminary supposed to enlighten the piece. The management of the shadows and lights makes what painters call the *clair-obscur*: the laws of which see under the article *CLAIR-OBSCURE*.

SHADOWS, *Genesis of Curves* by. See *CURVE*.

SHADOWS, *Blue*. See *BLUENESS*.

SHADUAN, in *Geography*, a small island in the Red sea. N. lat. $27^{\circ} 28'$. E. long. $33^{\circ} 58'$.

SHADWELL, THOMAS, in *Biography*, a dramatic writer, and poet-laureat to king William III., was descended of an ancient family in Staffordshire, and was born about the year 1640, at Lanton-hall, in Norfolk, a seat belonging to his father, who was bred to the law, but having an ample fortune did not practise, choosing rather to serve his country as a magistrate. He was in the commission for three counties, *viz.* Middlesex, Norfolk, and Suffolk, and discharged the duties of the office with distinguished ability, and the most perfect integrity. In the civil wars he had been a considerable sufferer for the royal cause, so that having a numerous family, he was reduced to the necessity of selling and spending a considerable part of his estate to support it. In these circumstances he resolved to educate his son to his own profession. He was sent for preparatory studies to Caius college, Cambridge, and was afterwards entered at the Temple, but becoming acquainted with some of the wits of that time, he deserted his profession and devoted himself to literature. It was not long before he became eminent in dramatic poetry, and he appeared before the public as the writer of a comedy entitled "The fallen Lovers," or "The Impertinents," which was acted in the duke of York's theatre, and in 1668 it was printed. The success of this piece encouraged the author to proceed, and he from this period rapidly brought out plays, chiefly of the comic kind, till he had reached the number of seventeen. His model was Ben Jonson, whom he imitated in drawing humorous characters, rather from his own conceptions than from nature; and though his name has not been transmitted to posterity with much encomium, and his works have long since disappeared from the stage, yet some of his delineations are said to display much real humour. Lord Rochester has given him a respectable place among his contemporaries; he says,

"None seem to touch upon true comedy,
But hasty Shadwell, and slow Wycherly."

As every one in those days was of necessity a party man, Shadwell ranked himself among the Whigs, and in consequence of this he was set up as a rival to Dryden. Hence there grew a mutual dislike between them, and upon the

appearance of Dryden's tragedy, entitled the "Duke of Guise," in 1683, Shadwell was charged with having the principal hand in writing a piece, entitled "Some Reflections on the pretended Parallel in the Play called the Duke of Guise, in a Letter to a Friend," which was printed the same year. Dryden wrote a vindication of the Parallel, and a considerable storm was raised both against Shadwell and his friend Hunt, who assisted him in it, and who on this occasion was forced to fly into Holland. Dryden, by way of revenge upon Shadwell, wrote the bitterest satire against him that ever was penned; this was the celebrated *Mac-Flecknoe*.

In 1688 Shadwell was appointed to succeed his rival Dryden in the laureatship, an honour which he did not enjoy many years. He died suddenly in the year 1692, in the fifty-second year of his age, at Chelsea, and was interred in the church there. Dr. Nicholas Brady preached his funeral sermon, in which he assures us, "that the subject of his discourse was a man of great honesty and integrity, and had a real love of truth and sincerity; an inviolable fidelity and strictness to his word; an unalterable friendship wherever he professed it; and a much deeper sense of religion, than many others have who pretend to it more openly." The titles of Shadwell's plays are given in the *Biographia Dramatica*. An edition of his works, consisting of those plays and miscellaneous poems, was printed in 1720, in four vols. 8vo. The earl of Rochester, in speaking of Shadwell, says, "If he had burnt all he had written, and printed all he spoke, he would have had more wit and humour than any other poet."

SHADWELL, in *Geography*, a parish in the Tower division of the hundred of Ossulston, and county of Middlesex, England, is situated about two miles and a half E. by S. from St. Paul's cathedral. It was formerly called Chadwell, as is supposed from a spring dedicated to St. Chad, and constituted a hamlet in the parish of Stepney, till separated from it, and made parochial, in 1669. The extent of this parish is very small, being only 910 yards in length, and 760 in breadth, and is wholly covered with houses, except a few acres, called Sun Tavern fields, which are appropriated as rope-walks. That portion of it which adjoins the Thames, and is called Lower Shadwell, is chiefly inhabited by tradesmen, and manufacturers connected with the shipping; such as ship-chandlers, biscuit-bakers, wholesale butchers, malt-makers, sail-makers, anchor-smiths, coopers, &c. A market which had been formerly held at Shadwell under the authority of a charter of king Charles II., but which was long disused, has been revived within the last few years. The church, dedicated to St. Paul, is a modern structure of brick. The living is a rectory in the gift of the dean of St. Paul's. In Shakspeare's walk is a meeting-house for Presbyterian dissenters, opened only on Sunday evenings, when sermons are delivered by dissenting ministers of different denominations, for the support of a charity-school, in which 50 boys and 20 girls are clothed and educated. Here are also a Calvinist meeting-house, and a chapel for Wesleyan Methodists, who have a Sunday-school attended by above 100 children. A third charity-school, founded in 1712, and partly endowed by queen Anne, provides clothes and education for 80 boys and girls.

The Shadwell water-works, which were established in 1669, and served a district containing 8000 houses, have been lately disused; the premises having been purchased by the East London Water-works' company, by whom this parish and its neighbourhood are now supplied with water. In Sun Tavern fields is a mineral spring, called the Shadwell Spa, which long sustained a high character for its medicinal qualities.

qualities, but it has lately fallen into disrepute. Barracks for the accommodation of the Chinese and Lascar sailors, during their stay in England, have been recently erected here, and frequently lodge upwards of a thousand persons. According to the parliamentary returns of 1811, Shadwell parish contains 1694 houses, and 9855 inhabitants. Lysons' Environs of London, 4to. 1795. Supplement, 1811. Stow's History of London, folio.

SHADWICKS, a town of America, in North Carolina; 10 miles W.S.W. of Hillsborough.

SHAFEITES, in the *History of Mahometanism*, the followers of Mohammed Ebn Edris al Shafei, the author of the third orthodox sect, who were formerly spread into Mawara'lnahr, and other parts eastward, but are now chiefly of Arabia. Al Shafei was born either at Gaza or Ascalon, in Palestine, in the year of the Hegira 150, on the same day in which, as some say, Abu Hanifa, the founder of the Hanefites, the first of the four orthodox sects, died; and was carried to Mecca at two years of age, where he was educated. He died in 204, in Egypt, whither he went about five years before, though Abulfeda says he lived 58 years. This doctor was very highly esteemed for his excellency in all parts of learning, inasmuch that his contemporary, Ebn Henbel, used to say that he was as the sun to the world, and as health to the body. Al Shafei is said to have been the first who discoursed of jurisprudence, and methodized that science; and accordingly it was wittily said of him, that the relators of the traditions of Mahomet were asleep, till Al Shafei came and awoke them. He was a great enemy to the scholastic divines. It is said of him, that he used to divide the night into three parts; one for study, another for prayer, and the third for sleep. It is also related of him, that he never so much as once swore by God, either to confirm a truth, or to assert a falsehood; and that being once asked his opinion, he remained silent for some time; and when the meaning of his silence was demanded, he answered, "I am considering first whether it be better to speak or to hold my tongue." The following saying is also recorded of him, "Whoever pretends to love the world and its creator at the same time is a liar." Sale's Koran, Int.

SHAFERS, in *Geography*, a town of Pennsylvania; 48 miles N.E. of Easton.

SHAFT, in *Building*. The *shaft of a column* is the body of it; thus called from its straightness; but by architects more frequently the *fuyl*. See the dimensions under **COLUMN**.

SHAFT is also used for the spire of a church-steeple; and for the shank or tunnel of a chimney.

SHAFT, or *Tunnel-Pit*, is the well through which the stuff, excavated from a tunnel, is drawn up to the surface.

SHAFT of a Mine, is the hollow entrance or passage into a mine, sunk or dug to come at the ore.

In the tin-mines, after this is sunk about a fathom, they leave a little, long, square place, which is called a *shamble*.

Shafts are sunk some ten, some twenty fathoms deep into the earth, more or less. Of these shafts, there is the landing or working-shaft, where they bring up the work or ore to the surface; but if it be worked by a horse engine or whim, it is called a whim-shaft; and where the water is drawn out of the mine, it is indifferently named an engine-shaft, or the rod-shaft. See **MINE** and **QUARRY**.

SHAFT, in *Agriculture*, a name provincially applied to a handle of a tool; as a spade, fork, &c.

SHAFTS of Carts and Waggons, the parts or poles be-

tween which the thill-horses draw. The manner in which the fore-horses are attached to these shafts, when there are more than the thill-horses in the teams, is a matter of great consequence; as the weight or pressure on them is more or less, according to its nature, and the way in which it is performed. See **THILL-Horses** and **WAGGON**.

SHAFT-Drain, that sort which is effected by carrying a fort of shaft or pit down to the porous stratum below, and which is in use where a superficial descent cannot be had for the collected waters, and an open stratum lies beneath the subsoil, ready to receive it. A communication between them becomes here of high advantage, as the cost and attention of raising the water by machinery may thereby be avoided. In cases of this kind, Mr. Marshall advises the drainer to ascertain the lowest point of the scite to be improved; and there, says he, sink a shaft down, and into, the receiving stratum, and fill it up to within a few feet of the surface, with rough stones, the roots of trees, or other open materials; and, on the top of these, form a filter, with heath and gravel, or other substances, that will prevent earthy matter, or water in a foul state, from entering the shaft: and to this filter lead the collected waters. And that where the water is collected by the means of covered drains, and where the filter also has a covering placed over it, the entire process will be free from external injury; and a work of this kind may remain unimpaired for ages. But even if the waters were collected by open drains, and the filter were suffered to remain in a state of neglect, until the shaft, in process of time, should become defective, the remedy would be easy. Embrace, says he, a dry season to re-open the shaft, and to cleanse it, and the materials with which it may be filled, from their impurities; and thus restore it, at a small expence, to its original state of perfection. It is further stated also, that if the scite of improvement be liable to any other surface-water, than what falls on its own area, such water ought to be conducted away from it superficially, by cutting it off at such a height as will gain a sufficient fall. And that where the quantity of water, which descends into it subterraneously, (or would descend, if a free passage were opened for it,) should be found to be too copious to be readily discharged by a shaft-drain, in the manner here proposed, proper efforts should be used to cut off the supply, or as much of it as may be, by a perforated trench or otherwise, at a sufficient height to be able to convey it away superficially; and with a sufficient fall, to prevent its entering the area to be improved; which will thus have only its own superfluous waters to discharge by the shaft. He is desirous to clear the way which leads to this valuable improvement, as he is convinced that there are many instances in which it might be applied with great profit. Many of the low, flat-lying, moory vallies of Norfolk, from whose bases superficial drains would be difficult to make, have for their substructures, it is probable, he says, insatiable depths of sand; and that, in every district of the island, such objects as are proper for this practice may be found.

SHAFTESBURY, *Earl of*, in *Biography*. See **COOPER**.

SHAFTESBURY, or **SHAFESBURY**, in *Geography*, a borough and market-town in the hundred of Upwimborne, Shafton division of the county of Dorset, England, is situated at the distance of 28 miles N.N.E. from Dorchester, and 101 miles W.S.W. from London. Concerning the origin of this town much difference of opinion prevails. While some authors ascribe its foundation to Cicuber, Lud, or Cassibelan, supposed kings of the Britons, many years previous to the birth of Christ; others limit its antiquity to the reign of Alfred. This last opinion

is supported by Camden, upon the evidence of an inscription mentioned by William of Malmesbury, which seems to point out Alfred himself as the founder, and is certainly much more probable than those which rest on the fanciful speculations of Jeffrey of Monmouth. There are circumstances, however, indicating Roman habitation on the site of Shaftsbury; and assuming this as a fact, some later writers contend that the words of the inscription, "Aelfredus rex fecit hanc urbem," are only intended to denote that Alfred renewed or repaired this city. But whatever may have been its condition previous to that monarch's reign, it was then only that it first attained any authenticated degree of celebrity, by the foundation of a monastery for nuns of the Benedictine order. This convent was indubitably the work of the great prince above-mentioned, as the charter of foundation, appointing his daughter Ethelgeda abbess, is yet extant. It was originally dedicated to the Virgin Mary, and became one of the richest and best endowed nunneries in England, occupied a great extent of ground, and possessed a vast number of offices and apartments within its precincts. The abbess was among the number of those who held a whole barony in capite, and was in consequence liable to serve in parliament, though excused on account of her sex. She had writs, however, directed to her, to send her quota of men into the field, according to her knight's fees. On the translation of the body of Edward the Martyr hither, from Wareham, this monastery assumed the name of that saint, which it retained till the dissolution. Many miracles are said to have been wrought at his shrine, which was visited by an immense concourse of pilgrims, among whom was the illustrious Canute, who died here. After the Conquest, this convent was for some time neglected; but the patronage of succeeding monarchs soon restored it to celebrity, and conferred upon it such extensive donations in land, that it became proverbial to say, "that if the abbot of Glastonbury might marry the abbess of Shaftsbury, their heir would have more land than the king of England." At the dissolution, the nuns amounted to fifty-four in number, and enjoyed a revenue valued by Speed at 1329*l.* 1*s.* 3*d.* The last abbess was Elizabeth Zouche, who had an yearly pension assigned to her of 133*l.*

Shaftsbury is a very ancient borough by prescription, being mentioned as such in Domesday Book. It was not, however, incorporated by regular charter till the reign of queen Elizabeth, who confirmed all the privileges it enjoyed by custom, and vested the government in a corporation, consisting of a mayor, recorder, twelve aldermen, a bailiff, and common council-men. That charter has since been confirmed by kings James I. and Charles II., with little variation. Henry VIII. made this town the seat of a suffragan bishop, but it did not retain its episcopal dignity above a few years. Shaftsbury has sent two members to parliament since the 25th year of Edward I. They are elected by the inhabitants paying scot and lot, who are estimated at about 300 in number, and are returned by the mayor. Shaftsbury has a weekly market on Saturday, and one annual fair; and according to the parliamentary returns of 1811, contains 515 houses, and a population of 2159 persons.

The town of Shaftsbury is most pleasantly situated, being built on a very lofty eminence, which commands an extensive prospect over the three adjoining counties of Dorset, Somerset, and Wilts. From the irregularity and narrowness of most of the streets, and the mean character of the buildings, however, it presents but an indifferent appearance. In ancient times it was more flourishing and important than at

present; containing, besides the abbey-church, twelve others, several chantries and fraternities, and a priory or hospital of St. John the Baptist. Of these public structures only four churches remain, respectively dedicated to St. Peter, the Holy Trinity, St. James, and St. Rumbald. The principal of them is St. Peter's, which is a building of considerable antiquity, and discovering much elegance in its symmetrical proportions and ornaments; but the greater part of it is defaced by modern alterations. Of the abbey scarcely a vestige is visible, the whole having been demolished soon after the dissolution, except the high embattled wall, supported by buttresses, which formerly inclosed the park, and is still in part standing on the side next the town. The other principal buildings of Shaftsbury are the town-hall, a free-school, two alms-house tenements, and three meeting-houses, for Presbyterians, Methodists, and Quakers.

The manor of Shaftsbury appears from Domesday Book to have been very anciently divided into two moieties, one of which belonged to the crown, and the other to the abbey. The abbey manor was surrendered in the 30th year of Henry VIII., whose successor granted it to Thomas Wriothesley, earl of Southampton, together with the town, borough, site, and precincts of the monastery. From him it passed to sir Thomas Arundel, and afterwards to the earls of Pembroke, by one of whom, Philip, the royalty of the manor, and borough manor, were sold to Anthony Ashley Cooper, earl of Shaftsbury, in whose family they still continue.

West from the town is an eminence called Castle Green, which is supposed to have received that appellation from its having been the site of an ancient castle, though history is silent respecting any such structure belonging to Shaftsbury. On the brow of this hill is a small mount, surrounded by a shallow fosse, which may have belonged to it, but it is commonly regarded as a Roman intrenchment. Tradition reports that the old town stood here, and it is certain that it occupied somewhat different ground from the site of the present buildings. The immediate vicinity of Shaftsbury is noted as the birth-place of the Rev. James Granger, author of the celebrated Biographical History of England. Beauties of England and Wales, vol. iv. by John Britton and E. W. Brayley, 8vo. 1803. Hutchins's History of Dorsetshire, fol. 1776, 2d. edit. 1797. History of the Ancient Town of Shaftsbury, 12mo. 1808.

SHAFTSBURY, a considerable and flourishing post-town of America, in the county of Bennington, Vermont, having Arlington on the north, and Bennington on the south, and containing 1973 inhabitants.

SHAG ISLAND, an island near the entrance into Christmas sound, on the S. coast of the island of Terra del Fuego; 4 miles N.E. of York Minster.

SHAGGE, or SHAG, in *Ornithology*, a name by which we call a water-fowl common on the northern coasts, and called by Mr. Ray *corvus aquaticus minor*, or the lesser cormorant, being properly a bird of the cormorant kind, or the *pelicanus graculus* of Linnaeus.

It is somewhat larger than the common duck, and weighs about four pounds; its beak is straight and slender, and is not flattened, but roundish; it is four inches long, and is hooked at the end; its mouth opens very wide, and its eyes are small; the head is adorned with a crest, two inches long, pointing backward; the whole plumage of the upper part of this bird is of a fine and very shining green, the edges of the feathers a purplish-black; but the lower part of the back, head, and neck, wholly green; the belly dusky, and the legs black. It builds in trees as the common cormorant, swims with the head erect, and is very difficult to be

shot; because, when it sees the flash of a gun, it pops under water, and does not rise but at a considerable distance.

SHAGR, in *Geography*, a town of Syria, in the pachalic of Aleppo; 40 miles W. of Aleppo. N. lat. $35^{\circ} 45'$. E. long. $36^{\circ} 25'$.

SHAGREEN, or CHAGREEN, derived from the Tartar *şaghrè*, a kind of grained leather, prepared in Astrachan, chiefly by Tartars and Armenians, and mostly used in the covers of cases, books, &c. It is very close and solid, and covered over with little roundish grains, or papillæ. It is brought from Constantinople, Tunis, Tripoli, Algiers, and some parts of Poland.

There has been a dispute among authors, what the animal is from which the shagreen is prepared? Rauwolf assures us it is the onager, which, according to him and Bellonius, is a kind of wild ass. Vide Ray, Synopf. An. Quad. p. 63.

It is added, that it is only the hard part of the skin which is used for this purpose. Or, it is that part of the skin that grows about the rump: that of horses is said to be equally good. There are large manufactures of it at Astrachan, and in all Persia. Borel says, it is the skin of a sea-calf; others, of a kind of fish, called by the Turks *şagrain*, whose skin is covered with grains; and those so hard, that they will rasp and polish wood.

There is also a sort of shagreen, which was formerly made of the skin of the *squatina*: in English, the monk or angel-fish, but now of that of the greater dog-fish. Vide Willughby Ichth. p. 80.

SHAGREEN, *Manner of preparing*. The process for making shagreen is as follows: of horse-hides and ass-hides the hinder back-piece, cut off immediately above the tail in nearly a semi-circular form about an arshine and a half upon the crupper, and rather less than an arshine along the back, is selected as the only part that is useful, and the rest is thrown away. The back pieces thus cut out are laid in a vat filled with clean water, and left in it several days successively, till they are thoroughly soaked, and the hair comes freely off. Then the hides are taken one by one out of the vat, spread against a board set slanting against the wall, one corner of it reaching over the edge of the board where it is fastened; and in this position the hair is scraped off with a blunt scraper, urak, and with the hair the upper pellicle; and the cleansed skin is laid again in clean water to soften. This done, they take it a second time out, spread one piece after another in the manner before described, scrape now the flesh-side with the same scraping-iron, and the whole skin cleaned again on the hair-side with great care, so that nothing now remains of the softened skin but the clean finewy web which serves for parchment, consisting of thick fasciculi of mellow fibres, resembling a hog's bladder softened in water. After this preparation they immediately take in hand certain frames, peltzi, composed of a straight piece and a semi-circular bow, forming therefore nearly the shape of the skin, which is stretched in it with strings as even and uniform as possible; and during this operation is sprinkled between whiles with fair water, that no part of it can dry and occasion an unequal extension. In like manner they finally wet them when the whole stock of skins is stretched, and carry all the thoroughly wetted skins into the work-room. There the frames are one by one laid flat on the floor, so that the flesh-side of the stretched skins is turned undermost. The other side is now thick strewed over with the black, very smooth, and hard seeds of a species of the herb goose-foot, or the greater orach (*chenopodium album*), which the Tartars call alabuta, and which grows in great abundance, and almost to man's height, about the southern Volga in farm-

yards and gardens; and that these may make a strong impression on the skin, a felt is spread over them, and the seeds trod in with the feet, by which means they are impressed deeply into the very yielding skins. Then, without shaking off these seeds, the frames are carried again into the open air, and set leaning against a fence or a wall to dry, in such manner that the sides covered with the seeds face the wall and cannot be shone on by the sun. In this situation the stretched skins must dry for several days successively in the sun, till no trace of moisture is perceptible in them, and they may be taken out of the frames. Then, when the impressed seeds are beaten off from the hair-side, it appears full of little pits and roughnesses, and has got that impression which the grain of the shagreen ought to produce when the true polish has been given to the skin by art, and the ley now to be mentioned has been used previous to the staining.

The polish is done on a stretching-bench, or a board on tressels, furnished with a small iron hook, and covered with some thick felts or voloks of sheep's wool, on which the dried shagreen-skin may lie soft. This is hung in the middle, by a hole which has been occasioned by the string in the stretching, to the hook, and fastened at the end by a string with a weight or a stone, by means of which the skin is allowed to move to and fro, but cannot easily be shoved out of its proper situation. This done, the polishing or rasping is performed by two several instruments; the first is called by the Tartars tokar, being an iron, crooked at one end like a hook and sharpened. With this the surface of the shagreen is scraped pretty sharply, in order to remove the most prominent rugosities, which from the horny hardness of the dried skin is no easy matter, and in which great care must be taken not to shave away too deeply the impressions of the alabuta-seeds, of which there is imminent danger if the iron be kept too sharp. As the blade of this iron is very narrow, it will make the shagreen rather uneven, and therefore after it, must be used the other scraper, or urak, by which the whole surface acquires a perfect equality, and only a slight impression remains of the seeds, exactly as it ought to be. After all these operations the shagreen is laid again in water, partly for rendering it supple and partly to make the elevated grain appear; for the seeds having caused pits in the surface of the skin, the interstices of these pits have lost their prominent substance by the polishing or shaving, and now the points that were pressed down, having lost nothing of their substance, spring up above the shaved places, and thus form the grain of the shagreen. To this end the pieces of shagreen are left to soften twice 24 hours in water, and are floated several times afterwards in a strong and hot ley, which is obtained by boiling from an alkaliescent saline earth, schora, found about Astrachan. From this ley the skins are bundled warm one on another, and thus suffered to lie some hours, by which they swell up and are softened in an extraordinary manner. Again, they are left to lie 24 hours in a moderately strong brine of common salt, by which they are rendered fine and white, and excellently adapted to receive any agreeable colour, which the workman hastens to give them as soon as they are come out of the pickle. The colour most commonly communicated to the fine shagreen is the sea-green, as the most beautiful. But the expert shagreen-makers have the art of making also black, red, blue, and even white shagreen.

For the green dye, nothing more is necessary than fine copper-filings and sal-ammoniac. As much of the latter is melted in hot water as the water will admit. With this sal-ammoniac water the shagreen skins, still moist from the brine, are brushed over on the ungrained flesh-side, and when they are thoroughly wetted, a thick layer of copper-filings

is strewed over them, the skins doubled together, so that the strewed side lies inwards, and then each, being rolled apart in a little felt or voilok, they lay all these rolls orderly on one another, and press them equally by a considerable and uniformly pressing weight, under which they must lie twenty-four hours. In this time the sal-ammoniac water dissolves enough of the cupreous particles for penetrating the skin with an agreeable sea-green colour; and though it be not strong enough the first time, yet a second layer of copper-dust, wetted with sal-ammoniac water, with which the skins must lie again twenty-four hours, will be quite sufficient for staining them thoroughly; when they may be properly cleaned, spread out, and dried. For giving the blue colour to shagreen, they use only indigo, which to this end is not so prepared as for the silk and cotton-dyers, but entirely without bones, only by strenuous friction, is mingled and dissolved with the other ingredients. They put about two pounds of finely grated indigo in the kettle, pour cold water on it, and stir it till the dye begins to dissolve. They next dissolve in it five pounds of pounded alakar, which is a sort of barilla, or raw soda-salt, burnt by the Armenians of Kitzliar, and a worse kind by the Kalmucks, adding two pounds of lime and one pound of virgin honey, all thoroughly stirred, and set in the sun for several days, during which the stirring is frequently repeated. The shagreen skins which are to be made blue must be put only in the natrous ley, schora, but not in the brine made of common salt. They are again folded up wet, and sewed close together round the edges, with the flesh-side turned inwards, and the shagreened hair-side outwards, upon which they are three times dipped in succession in an old store-dye kettle, at every time pressing out the superfluous dye; lastly, they are all brought into fresh dye, which must not be pressed out, and with which the skin is hung up in the shade to dry; they are, for the last time, cleaned, ornamented on the edges, and reduced to order. For the black shagreen they employ nut-galls and vitriol in the following manner: the skins, still moist with the brine, are thick strewed with finely powdered nut-galls, folded together, and laid one on another twenty-four hours. In the mean time a new ley of bitter earth-salts or schora is boiled and poured hot in little troughs or trays. In this ley each skin is waved to and fro several times, is again strewed with pulverized nut-galls, and again laid in heaps for some time, that the virtue of the galls may thoroughly penetrate the skins, which are then suffered to dry, and are beat out to clear them from the galls. When this is done, the skin is smeared on the shagreen-side with mutton suet, and laid a little in the sun, that it may absorb the fat. It is the custom, likewise, with the shagreen-makers to roll up each skin apart, and to squeeze and press it against some solid body, in order to promote the absorption of the unctuous particles. The surplus is again scraped off with a blunt wooden scraper. This being done, and the skin having lain a little while, a sufficient quantity of iron-vitriol is dissolved in water, with which the shagreen is rubbed on both sides, by which it soon acquires a beautiful black colour: and now the edges and other defective parts are dressed. To obtain white shagreen, the skin must first be steeped in strong alum-water on the shagreened side. Having imbibed this, the skin is well rubbed on both sides with a paste of wheaten flour, and left to dry with it; then all the paste is washed away with alum-water, and the skin set to dry completely in the sun. As soon as the skins are dry, they are gently smeared over with clean melted mutton fat, leaving them in the sun to imbibe it, and are worked and pressed with the hands to promote this effect. Afterwards the skins are fastened one by one on

the above-mentioned stretching-bench, warm water is poured over it, and the superfluous fat scraped off with obtuse wooden instruments, to which the warm water just poured on has much assisted. By this process the shagreen receives a fine white colour, and needs only, in conclusion, to be dressed and rubbed. This whiteness, however, is given to the shagreen, not so much that it may continue in that state, but in order to impart to it a beautiful high red hue, as this end could not be obtained to such perfection without that preparation. But the shagreens intended to be stained red must not be brought out of the natrous bitter salt ley into the brine, but must be made white, in the manner above-described, and afterwards supplied with the brine, in which they are left to lie about twenty-four hours, or less, from the dye. The dye is made with cochennille or kirmis, as the Tartars call it. The operation is begun by boiling for a full hour about a pound of the dried herb tschagan, which grows plentifully on the salt steppes about Astrachan, and is a sort of kali, in a kettle large enough to contain about four common vedros of water, by which the water acquires a greenish colour. The herb is then taken out, and about half a pound of grated cochennille put into the kettle, with which the above decoction must boil another full hour, diligently stirring it on the fire, that the kettle may not boil over. Lastly, to this are added fifteen or twenty grains of the material which the dyers call lutter (perhaps orpiment), let the dye boil a little more, and then take the fire from under the kettle. Then the skins taken out of the brine are laid separately in trays, pouring the dye upon them four times, rubbing it in with the hands, that it may be equally spread and imbibed, pressing it out every time, which done, they are ready for drying and ornamenting; and sell much dearer than the others.

The best shagreen is that brought from Constantinople, of a brownish colour; the white is the worst. It is extremely hard; yet, when steeped in water, it becomes very soft and pliable; whence it is of great use among case-makers. It takes any colour that is given it, red, green, yellow, or black. It is frequently counterfeited by morocco, formed like shagreen: but this last is distinguished by its peeling off, which the first does not.

SHAGUM, in *Geography*, a river of America, which runs into lake Erie, N. lat. $41^{\circ} 49'$. W. long. $81^{\circ} 21'$.

SHAH, the Persian title corresponding to king, and equivalent to khan. (See CHAM.) Nevertheless, the most absolute Persian monarchs, who have never assumed any other title than that of shah, have permitted the governors of provinces in their empire to take that of khan, which is its equivalent, and which they have ever affected. Even in our time, the governors of the provinces of Ghilan, Mazanderan, &c. who have no more authority in Persia, than the pachas in Turkey, take the title of khan, the reason of which it is not easy to assign.

SHAHABAD, in *Geography*, a town of the kingdom of Candahar; 40 miles S.W. of Cabul.—Also, a town of Hindooistan, in the circar of Sirhind; 42 miles E.S.E. of Sirhind.—Also, a town of Hindooistan, in Oude; 45 miles W. of Kairabad. N. lat. $27^{\circ} 40'$. E. long. $80^{\circ} 20'$.—Also, a town of Hindooistan, in Oude; 25 miles S.W. of Mahomdy.

SHAHAMA, a name given to a colossal statue, cut in a mountain in the neighbourhood of the ancient city of Bamiyan, in the East Indies. This city, (which is described in our article BAMIYAN,) is eight days' journey north-westerly from Cabul, and is rarely visited by Europeans, though highly deserving of examination. The statue in question is accompanied by another, called Salsala. Native travellers

differ as to their height; from fifty cubits to eighty ells. Their origin, age, and sex, are also variously related. The few Hindoos who live in the neighbourhood, say, they are the statues of one of their heroes named Bhim, and his consort. Bhim is one of the five famous Pandus. (See PANDU.) The followers of Budha call them by the names first mentioned. The Mahomedans say, they are of Adam and Eve; and a third statue, half a mile distant, about twenty feet high, they say is of Seth, their son. The author of a celebrated Persian dictionary, entitled "Farhang Jehangiry," says they existed in the time of Noah; but gives them other names. There can be little doubt but these statues, and the wonderful excavations of the city of Bamian, scooped, like Thebes, out of a mountain, were executed by the same indefatigable race of workmen, who in the more southern parts of India constructed the gigantic statues in the simlar caverns at Kenera, on the island of Salfette, near Bombay, in the province of Kanara, and at Karly; all believed to be of Jaina or Budhaic origin. See JAINA, KARLY, and KENERA.

SHAHBUNDER, in *Geography*, a town of Hindoostan, in the province of Tatta; 45 miles S.S.W. of Tatta.

SHAHDOURAS, a town of Hindoostan, in the circar of Sirhind; 10 miles N. of Tannasar.

SHAHG, a town of Hindoostan, in Myfore; 18 miles S. of Vencatighery.

SHAHJEHAN, a town of Hindoostan, in Bahar; 18 miles N.W. of Bahar.—Also, a town of Hindoostan, in Rohilcund; 45 miles S. of Pillibeat.

SHAHJEHANPOUR, a town of Hindoostan, in Malwa; 20 miles N.E. of Ougein. N. lat. $23^{\circ} 26'$. E. long. $76^{\circ} 18'$.—Also, a town of Hindoostan, in Oude; 30 miles S.E. of Fyzabad. N. lat. $26^{\circ} 26'$. E. long. $82^{\circ} 40'$.—Also, a town of Hindoostan, in Mewat; 20 miles W. of Alvar.—Also, a town of Hindoostan, in Bahar; 14 miles S.S.E. of Patna. N. lat. $25^{\circ} 24'$. E. long. $85^{\circ} 30'$.

SHAHIGIAN, a town of Persia, in the province of Khorasan, near Maru, which since is called *Maru Shahigian*.

SHAHJOLE, a circar of Bengal, bounded on the north by Rajeshy, on the east by Mahmudshi, on the south by Jessore, and on the west by Kishenagur; about 30 miles long, and from 5 to 10 broad.

SHAHISABI, a town of Persia, in the province of Khorasan, on the borders of Bucharua; 80 miles N. of Maru.

SHAHI-SHAK, a town of Persia, in the province of Khorasan, on the borders of Bucharua; 5 miles N. of Maru.

SHAHPOUR, a town of Hindoostan, in Lahore; 30 miles W. of Nagorcote.—Also, a town of Hindoostan, in Lahore; 27 miles E. of Sealcot.

SHAHR and VAN, the ancient *Apollonia*, a town of the pachalic of Bagdad, 27 miles from Bacouba, which is nine furlongs from Bagdad, peopled by about 4000 Turks and Kurds, and is, upon the whole, a handsome little town, watered by two canals drawn from the Diala. At the distance of 18 miles is Kuzil Roobat, not so large as the former, situated in a sandy plain, about one mile from the river Diala. Khanakie is also a handsome little town, built on that branch of the Diala, which has its source in the mountains of Kurzend, 18 miles from Kuzil Roobat; it occupies both banks of the river, over which is a handsome bridge, and is surrounded by numerous gardens and plantations. Mendeli, about the same size as Solymania, is situated in one of the roads leading to Kermanshaw; and four furlongs on the Bagdad side is a fountain of naphtha. Thirteen leagues from Mendeli, and four from the foot of the mountains, is Bedri, the frontier town, in this quarter of the Turkish empire.

SHAIGI, a town of Nubia, on an island in the Nile; 130 miles E. of Dongala. N. lat. $20^{\circ} 20'$. E. long. $50^{\circ} 45'$.

SHAIGOL, a town of Persia, in the province of Khorasan; 10 miles S.W. of Maru.

SHAIMA, a town of Persia, in the province of Meccran, on the sea-coast; 200 miles W.S.W. of Kidge.

SHAIN, or HOLY, ISLES, three small islands of the Hebrides, or Western isles, are situated in the channel between the isles of Lewis and Skye, in the parish of Lochs and district of Lewis. These islands are well known to mariners, and are remarkable for their fine sheep pasturage. One of them, called St. Mary's island, has a small chapel upon it, dedicated to the Virgin, and bears marks of having been formerly better inhabited than at present. Sinclair's Statistical Account of Scotland, vol. xix. 8vo.

SHAINYMALY, a town of Hindoostan, in Coimbatore; 12 miles S. of Erroard.

SHAIJAR, a town of Syria, in the pachalic of Damascus, on the Orontes; 20 miles N. of Hamah.

SHAK, a town of Persia, in the province of Schirvan; 20 miles N.W. of Schamachie.

SHAKE, in *Musie*, is a grace, an embellishment of melody, of which the indication is a *h*, or sometimes only *t*, the initial of the Italian term *trillo*, which implies the same thing. There are two kinds of shakes, the continued, and the transient. The continued shake, upon a long note, must be practised at first by incipients, slow, and accelerated by degrees. The effect of a shake is a rapid motion of two adjoining notes: as *de*, *bc*, &c.



In our didactic and elementary articles, we should not wish to confine ourselves to mere dry definitions of terms of art; but, having had some little experience, we would gladly assist students, by pointing out the means of acquiring the practical use of what we describe.

With regard to a *vocal* shake, we can do young fingers no greater kindness, than in referring them to the 3d chap. of Tosi's "Observations on florid Song," as admirably translated by Galliard, and illustrated with the notes of that able and experienced master.

Tosi, after informing the student of the importance of the shake to fingers, says, "Let the master strive to enable his scholar to attain a shake that is equal, distinctly marked, easy, and moderately quick, which are its most beautiful requisites."

This excellent author describes the different kinds of shakes, and their preparation, that are worth cultivating, as well as those that are to be avoided. The free and open shake on the *whole tone* and the *semitone*, are certainly the principal.

The two tones or semitones that constitute the shake major or minor, should be equally loud and distinct; but above all, perfectly in tune with the notes of the general scale and particular key in which the performer is fingering. The Italians call a bad shake, or no shake at all, but a quivering upon the same note, *tosse da capra*, a goat's cough. If the finger is not possessed of a true and good shake, he or she had best refrain from ever attempting it; and if accustomed to elegant melody, and possessed of good taste and ornamental embellishments, the shake in songs of expression and pathos may be avoided with advantage.

As the acquiring of a good shake in fingering is a work of

time, difficulty, and uncertainty of success, several ingenious and elegant cadences have been invented in order to evade the shake. A good shake well applied is certainly a great ornament; but it is a matter of brilliancy more than expression; *non dice niente*, it says nothing—according to modern Italian critics, and is seldom wanted except at the end of a formal clofe. Those who have a good shake, like persons with a fine set of teeth, are too ambitious of letting you know it. The different kinds of shakes are expressed in notes on the music-plates. The plain note and trill are at present thought more elegant, and are more frequently used than the sudden and long continued rapid motion of the common shake.



Shakes upon keyed instruments are best practised at first with the second and third fingers; holding down at the same time the fifth below with the thumb, to keep the hand and the wrist quiet. And we recommend, contrary to the usual practice and precepts, beginning the shake with the lowest note; otherwise, in rapid transient shakes on semiquavers, there is not time for returning to the upper note; so that the shake is reduced to a mere appoggiatura. See GRUPPO and TRILL.

SHAKER-PIGEON, in *Ornithology*, a kind of pigeons, of which there are two sorts, the broad-tailed, and the narrow-tailed.

The first is the finest, and most valued. It has a beautiful long thin neck, which bends like the neck of a swan, leaning towards the back. It has a full breast, a very short back, and a tail consisting of a great number of feathers, seldom less than four-and-twenty, which it spreads in an elegant manner, like the tail of a turkey-cock, and bends it up so, that it meets the head. It is commonly all white, but sometimes is red, yellow, or blue-pied. The longer the neck of this bird is, the more it is valued.

The second, or narrow-tailed shaker, has a shorter and thicker neck and a longer back. It is esteemed by many a different species, but seems only a mixed breed with some other pigeon. They are called shakers, from a tremulous motion which they have with their necks when courting.

SHAKERS, in *Ecclesiastical History*, a sect which originated in Lancashire, with some deserters from the society of Quakers, or Friends, about the year 1747, and which continued for some time unconnected with every denomination of Christians. During this period, their testimony, derived, as they fancied and pretended, from what they saw by vision and revelation from God, was, "that the second appearing of Christ was at hand, and that the church was rising in her full and transcendent glory, which would effect the final downfall of Antichrist." From the shaking of their bodies in religious exercises, they were denominated Shakers, and by some persons they were called Shaking Quakers. The sect seems to have made no great progress until the year 1770, when the testimony originally announced was fully opened, according to the special gift and revelation

of God through Ann Lee, who was born of obscure parentage, at Manchester, about the year 1736; and who, having joined the society in 1758, became afterwards a distinguished leader among them. Her exercises, both of body and of mind, were singularly trying and severe for about the term of nine years; but she was thus prepared for receiving the testimony of God, against the whole corruption of man, in its root and every branch. Accordingly, her testimony was in the power of God, attended with the word of prophecy, and such energy of the Spirit, as penetrated into the secrets of the heart, and was irresistible, especially in those with whom she was united.

And from the light and power of God which attended her ministry, and the certain power of salvation transmitted to those who received her testimony, she was received and acknowledged as the *first Mother*, or spiritual parent in the line of the female, and the second heir in the covenant of life, according to the present display of the gospel. Hence among believers, she hath been distinguished by no other name or title than that of *Mother*, from that period to the present day. To such as addressed her with the customary titles used by the world, she would reply, "I am *Ann the Word*;" signifying that in her dwelt the *Word*.

In 1774, Ann Lee, with some of her followers, having been thought mad, and sorely persecuted, settled their temporal affairs in England, and set sail from Liverpool for New York. James Wardley and his wife remaining behind, were removed into an alms-house, and there died. The others, we are told, "being without lead or protection, lost their power, and fell into the common course and practice of the world!" Ann Lee and the brethren reached New York, after working a sort of miracle, for the ship sprung a leak on the voyage, and it is more than hinted, that had it not been for their exertions at the pump, the vessel would have gone down to the bottom of the ocean! She, however, left New York, and fixed her residence up the Hudson river, eight miles from the city of Albany. In this retired spot, her followers greatly multiplied, but she was not without bitter reproaches and manifold persecutions. She and the elders would delight in missionary journeys, being out for two or three years, and returning with wonderful accounts of their success.

After Mother and the elders were released from prison, they again collected together at Water-Vliet, where they were visited by great numbers from distant parts of the state of New York, Massachusetts, Connecticut, New Hampshire, and the district of Maine, who received faith; and through the power and gifts of God, which were abundantly manifested for the destruction of sin, and the salvation of souls, many were filled with joy unspeakable and full of glory, and increased in their understanding of the way and work of God.

Ann Lee died on the eighth day of the ninth month 1784. From the year 1780 to 1787 the credit of this sect revived in America, and the number of its adherents considerably increased.

The creed of the Shakers is very obscurely and mystically expressed. They seem to be believers neither of the Trinity nor of the Satisfaction. They deny also the imputation of Adam's sin to his posterity, as well as the eternity of future punishment. The tenets on which they most dwell are those of human depravity, and of the miraculous effusion of the Holy Ghost! Their leading practical tenet is the abolition of *marriage*, or indeed the *total separation* of the sexes. This circumstance of course attracts great attention, and they pride themselves on their superior purity. The essence of their argument is, that the *resurrection* spoken of in the New Testament means nothing more than *conversion*; our Saviour declares that *in the resurrection they neither marry nor are given in marriage*, therefore, on *conversion* or the *resurrection* of the individual, marriage ceases!!! To speak more plainly, the *single* must continue *single*, and the *married* must separate. Every passage in the gospel and in the epistles is interpreted according to this strange and *unnatural* hypothesis.

The system of the Shakers is thus pretty plainly described. "In the fulness of time, according to the unchangeable purpose of God, that same Spirit and Word of power, which created man at the beginning—which spake by all the prophets—which dwelt in the man Jesus—which was given to the apostles and true witnesses as the Holy Spirit and Word of promise, which groaned in them waiting for the day of redemption—and which was spoken of in the language of prophecy as a woman travailing with child, and pained to be delivered, was revealed in a *woman*."

"And that *woman*, in whom was manifested that Spirit and Word of power, who was anointed and chosen of God, to reveal the mystery of iniquity, to stand as the first in her order, to accomplish the purpose of God, in the restoration of that which was lost by the transgression of the first woman, and to finish the work of man's final redemption, was *Ann Lee*."

"As a chosen vessel, appointed by divine Wisdom, she, by her faithful obedience to that same anointing, became the temple of the Holy Ghost, and the second heir with Jesus, her lord and head, in the covenant and promise of eternal life. And by her sufferings and travail for a lost world, and her union and subjection to Christ Jesus, her lord and head, she became the *first born of many sisters*, and the true mother of *all living* in the new creation."

"Thus the perfection of the revelation of God in this latter day, excels, particularly, in that which respects the most glorious part in the creation of man, namely, the woman. And herein is the most condescending goodness and mercy of God displayed, not only in redeeming that most amiable part of the creation from the curse, and all the sorrows of the fall, but also in condescending to the lowest estate of the loss of mankind."

"So that by the first and second appearing of Christ, the foundation of God is laid and completed, for the full

restoration of both the man and the woman in Christ, according to the order of the new covenant, which God hath established in them for his own glory, and the mutual good and happiness of each other.

"And in this covenant, both male and female, as brethren and sisters in the family of Christ, jointly united by the bond of love, find each their correspondent relation to the first cause of their existence, through the joint parentage of their redemption."

"Then the man who was called Jesus, and the woman who was called Ann, are verily the two first foundation pillars of the church of Christ—the two anointed ones—the two first *heirs* of promise, between whom the covenant of eternal life is established—the first father and mother of all the children of regeneration—the two first visible parents in the work of redemption—and the invisible joint parentage in the new creation, for the increase of that seed through which all the families of the earth shall be blessed."

The Shakers record several cases which they pretend to be miraculous, but it is needless to enlarge on a system that is wholly founded in delusion.

SHAKERTOWN, in *Geography*, a town of Kentucky, in Mercer county, containing 298 inhabitants.

SHAKES, in *Ship-Building*, a name given to the cracks or rents in a plank, &c. occasioned by the sun or weather.

SHAKING, a disease in sheep, consisting of a weakness in their hind quarters, so that they cannot rise up when they are down. There has not hitherto been found any remedy for this disease. It is probably of the nature of palsy, and to be removed by strong nervous stimulant remedies.

SHAKLES, on board *Ship*. See SHACKLES.

SHAKRA, in *Geography*, a town of Arabia, in the province of Nedsjed; 120 miles N.E. of Faid.

SHAKSPEARE, WILLIAM, in *Biography*, an English dramatic poet, is justly esteemed the most eminent and most interesting author of the ancient or modern world. His writings have progressively risen in popular estimation in proportion as they have been studied and analysed. Some of his dramas are continually acted on the London and provincial stages; many critics and commentators, both English and foreign, have employed their pens, and exerted their faculties, in dissertations on the merits and defects of his productions. From the most trying and fastidious ordeal of investigation he has risen in glory and greatness; and may, at the present time, be justly pronounced pre-eminent and unrivalled as a dramatic poet.

To Englishmen his writings are singularly estimable; for they have conferred on the country a literary immortality, which nothing less than the dissolution of "the great globe itself" can annihilate. Nor is he exclusively endeared and valuable to the man of letters; but all classes of artists, and even many artisans, have derived both fame and emolument through the medium of his works. It has been often remarked, that the prophet is never honoured in his own country, or appreciated by his contemporaries. Although this maxim is now merely considered as figurative, and the age of, and confidence in, prophecy is past, yet it may be fully and strictly applied to the meritorious author. After decease, his whole merits are gradually unfolded; his talents and genius command admiration, and each reader and commentator seem eager to discover new beauties, and to point out hidden excellencies. Among the literary "worthies" of the world, from the days of Homer to Milton, no one has attained equal celebrity with Shakspeare. He now shines as the sun of the intellectual hemisphere, and every other poet seems to derive a reflected light from him, or moves in a less circumscribed orbit. Like divine nature, which was at once
his

his guide and goddess, his writings excite admiration and delight, the more intensely they are studied. Prompted by inspiration, and impressed with profound knowledge, with the keen and acute "poet's eye," he commanded every region of the terrestrial globe, penetrated the hidden thoughts of man, gave to "airy nothing" a local habitation and a name," and assigned to every passion and sentiment "its true form and feature."

'Tis wonderful,
That an invisible instinct should frame him
To poetry unlearned; honour untaught;
Civility not seen in other; knowledge
That wildly grew in him, yet yielded crops
As though it had been sown: for he could find
"Tongues in trees, books in the running brooks,
"Sermons in stones, and good in every thing."—
Do not smile at me that I boast him off,
For ye shall find he will outstrip all praise,
And make it halt behind him. DOVASTON.

Heaven has him now: let our idolatrous fancy therefore sanctify his reliques. Despairing to be his equals, let us profit by his precepts; seek to acquire his wisdom; emulate his gentleness, talents, and honours. Conscious of the comparative frigidness of our own faculties, let us warm our hearts at his celestial fire, and kindle our souls at his unextinguishable flame! If enthusiasm be justifiable on any subject, the writer of the present article hopes to stand excused in giving this latitude to his feelings and expressions. He has to regret, with thousands of others, that the subject of this memoir is only known in his writings, and that his personal history is as obscure as that of Homer or Archimedes. Indeed, before we proceed farther, it is necessary to premise, that a singular and unaccountable mystery is attached to Shakspeare's private life; and, by some strange fatality, almost every document concerning him has either been destroyed, or still remains in obscurity. The first published memoir of him was drawn up by Nicholas Rowe, in 1709, nearly 100 years after the decease of the poet; and the materials for this were furnished by Betterton, a player. It should be remembered, that the age in which he lived was not the age of minute inquiry. From Rowe's account, and from other evidence, it is clear that our poet was not ambitious of posthumous fame; that he disregarded the estimation of after ages; that he was unconscious of the high merit of his own writings; and that, though he was much in the public world, and died in comparative affluence, his private life and character were scarcely noticed by the biographer or critic. To the man of taste and refined sensibility, he has, however, bequeathed an exhaustless treasure in his dramatic productions; and as these constitute an essential part of the well-stored library, it is equally essential to record every fact, and investigate every problematic statement, relating to the inestimable author.

That he was born at Stratford-upon-Avon, in Warwickshire, on the 23d of April 1564, is well ascertained; and that he was baptized on the 26th of the same month, appears by the parish register. He is there described as the son of John Shakspeare, who, according to Rowe, and most subsequent biographers, was "a considerable dealer in wool," and whose "family were of good figure and fashion." Opposed to this statement is that of John Aubrey, who entered himself as a student in the university of Oxford, 1642, only 26 years after our poet's death; who derived his information from "some of the neighbours" of Shakspeare, and who appears to have made a practice of writing down every fact and tradition that he heard relating to public characters.

His account is entitled not only to recital, but to cautious consideration.

"Mr. William Shakspeare was borne at Stratford-upon-Avon, in the county of Warwick; his father was a butcher; and I have been told heretofore by *some of the neighbours*, that when he was a boy he exercised his father's trade, but when he kill'd a calfe, he would doe it in a high style, and make a speech. There was at that time another butcher's son in this towne that was held not at all inferior to him for a naturall witt, his acquaintance and coetanean, but dyed young. This Wm. being inclined naturally to poetry and acting came to London, I guesse about 18, and was an actor at one of the play-houses, and did act exceedingly well. Now B. Jonson was never a good actor, but an excellent instructor. He began early to make essayes at dramatique poetry, which at that time was very lowe, and his playes tooke well. He was a handsome well-shap'd man, very good company, and of a very readie and pleasant smooth witt. The humour of — the constable in *A Midsummer Night's Dreame* he happened to take at Grendon in Bucks, which is the roade from London to Stratford, and there was living that constable about 1642, when I first came to Oxon. Mr. Jos. Howe is of that parish, and knew him." (See Warton's Life of Sir Thoinas Pope.) "Ben Jonson and he did gather humours of men dayly wherever they came. One time, as he was at the tavern at Stratford-upon-Avon, one Combes, an old rich usurer, was to be buried; he makes there this extemporary epitaph:

'Ten in the hundred the devill allowes
But Combes will have twelve, he fwears and vowes:
If any one askes who lies in this tombe,
'Hoh!' quoth the devill, 'tis my John o'Combe.'

"He was wont to goe to his native country once a yeare. I thinke I have been told that he left 2 or 300 lib. per annum there and there-about to a sister. I have heard sir Wm. Davenant and Mr. Thomas Shadwell (who is counted the best comedian we have now) say, that he had a most prodigious witt, and did admire his naturall parts beyond all other dramaticall writers. He was wont to say that he never blotted out a line in his life: sayd Ben Jonson 'I wish he had blotted out a thousand.' His comedies will remain witt as long as the English tongue is understood, for that he handles *mores hominum*; now our present writers reflect so much upon particular persons and coxcombeities, that twenty yeares hence they will not be understood.

"Though, as Ben Jonson sayes of him, that he had but little Latine and lesse Greeke, he understood Latine pretty well, for he had been in his younger yeares a schoolmaster in the country." The latter fact was communicated by Mr. Beekton.

In another memorandum Aubrey states, that

"Mr. William Shakspeare was wont to goe into Warwickshire once a yeare and did comonly in his journey lye at this house in Oxon" (*i. e.* the Crown tavern, kept by the father of sir William Davenant,) "where he was exceedingly respected. * * * * * Now sir Wm. would sometimes, when he was pleasant over a glasse of wine with his most intimate friends, — e. g. Sam. Butler (author of *Hudibras*) &c. say, that it seemed to him that he writt with the very spirit that Shakspeare, and seemed contented enough to be thought his son * * * * *"—These anecdotes are now published in "Letters written by eminent Persons in the Seventeenth and Eighteenth Centuries," three vols. 8vo. 1813.

This account is truly curious and interesting; and in
spite

SHAKSPEARE.

spite of the scepticism of Dr. Farmer, in his "Essay on the Learning of Shakspeare," and of some other writers, the impartial reader must admit that it assumes the air of probability, candour, and truth. Aubrey might have erred in some points; particularly in saying, Shakspeare visited London at the age of eighteen, when the registry of his own baptism, and that of his twin-children, shew that he must have remained at home till the age of twenty. Again, it is very probable that he met with a constable at Grendon, or Long-Crendon, in Buckinghamshire, whose character he dramatised, not in "A Midsummer Night's Dream," but in "Much ado about Nothing," or in "Love's Labour's Lost." The extempore epitaph on John o'Combe is represented by Rowe, who gives it different to the above, as having been made during the life-time, and in the presence of the person commemorated, who is also said never to have forgiven the poet. In Aubrey's relation there is nothing improbable, nor unreasonable, in a poet producing such lines sportively over his cups, and among convivial friends: it is a smart epigram on an usurious character. Instead of leaving 300*l.* *per annum* to a sister, he bequeathed as much to his daughter, as will be shewn in the sequel. If there be any lurking prejudice against the profession of a butcher, let it be remembered, that the proud and ostentatious cardinal Wolsey was the son of a butcher; and that the parentage of a Homer, a Milton, and a Shakspeare, cannot be honoured or degraded by their ancestors.

"Honour and fame from no condition rise;
Act well your part, there all the honour lies."

The house in which our poet was born has been occupied by a succession of butchers from time immemorial. Besides, it is not at all improbable that the butcher and the wool-stapler were united in one person. Admitting this, we shall find Rowe and Aubrey in harmony, and one great difficulty removed.

The early education of Shakspeare, as well as his parentage, is not ascertained: on this topic all the biographers and commentators have supplied us with conjectures and opinions. Chalmers, in his "Apology," is at once ingenious, intelligent, and learned on this subject. Rowe observes, and most of his followers repeat the same, that he "was bred for some time at a free school, where it is probable he acquired what Latin he was master of." They proceed to remark, that "on leaving school, he seems to have given entirely into that way of living which his father proposed to him." About the age of eighteen he married Anne Hathaway, daughter of a substantial yeoman, then residing at Shottory, a hamlet to Stratford. In the parish register we find that "Susanna, daughter of William Shakspeare, was baptised May 26, 1583." By the same record we learn that his wife produced him twins in 1584-5; as on the 2d of February in that year, the names of Judith and Hamnet are entered in the register. It must have been soon after this event that our poet visited the metropolis; but the cause of leaving his native place, as well as his object, connection, and prospects in London, are alike unknown. Rowe relates, and others have adopted the opinion, with some variation as to sentiment and inference, that, "falling into ill company," he was induced, "more than once," to assist his associates in stealing deer from a park belonging "to sir Thomas Lucy, of Charlcoate, near Stratford. For this he was prosecuted by that gentleman so severely," that he was first impelled to write a satirical ballad on him, and afterwards fly from his home to avoid arrest and imprisonment. This story, however, is not

entitled to full credence; for though our young poet might have associated with some idle youths, and have accompanied them to the neighbouring park, either for the sake of catching deer, or for some less *difficult* and *less hazardous* enterprise, yet the circumstance seems improbable, and comes in such "a questionable shape," that before it be admitted as historical evidence against an amiable man and super-eminent author, it should be supported by "confirmations strong as proofs of holy writ." Without resting on this circumstance, or crediting another absurd story, of his holding horses at the door of a theatre for his livelihood, we shall find a rational motive for his visiting London, and resorting to the theatre, by knowing that he had a relative and townsman already established there, and in some estimation. This was Thomas Green, "a celebrated comedian."

We now come to that era in the life of Shakspeare, when he began to write his immortal dramas, and to develop those powers which have rendered him the delight and wonder of successive ages. At the time of his becoming, in some degree, a public character, we naturally expected to find many anecdotes recorded of his literary history: but, strange to say, the same destitution of authentic incidents marks every stage of his life. Even the date at which his first play appeared is unknown; and the greatest uncertainty prevails with respect to the chronological order in which the whole series were written, exhibited, or published. As this subject was justly considered by Malone to be both curious and interesting, he has appropriated to its examination a long and laborious essay. Chalmers, however, in his "Supplemental Apology," and in a recent pamphlet, 1815, endeavours to controvert some of Malone's dates, and assigns them to other eras; as specified in the second column, below. Malone says, the "First Part of King Henry VI." published in 1589, and commonly attributed to Shakspeare, was not written by him, though it might receive some corrections from his pen at a subsequent period, in order to fit it for representation. The "Second Part of King Henry VI." this writer contends, ought therefore to be considered as Shakspeare's first dramatic piece; and he thinks that it might have been composed about the year 1591, but certainly not earlier than 1590. The other dramas are placed in the following order of time by him and by Mr. George Chalmers.

	According to Malone.	According to Chalmers.
The Third Part of Henry VI. } was written in - - -	1591	1595
A Midsummer Night's Dream - - -	1592	1598
Comedy of Errors - - -	1593	1591
Taming of the Shrew - - -	1594	1598
Love's Labour's Lost - - -	1594	1592
Two Gentlemen of Verona - - -	1595	1595
Romeo and Juliet - - -	1595	1592
Hamlet - - -	1596	1597
King John - - -	1596	1598
King Richard II. - - -	1597	1596
King Richard III. - - -	1597	1595
First Part of Henry IV. - - -	1597	1596
Second Part of Henry IV. - - -	1598	1597
Merchant of Venice - - -	1598	1597
All's Well that ends Well - - -	1598	1599
King Henry V. - - -	1599	1597
Much ado about Nothing - - -	1600	1599
As you like it - - -	1600	1599
Merry Wives of Windsor - - -	1601	1596
King Henry VIII. - - -	1601	1613
		Troilus

SHAKSPEARE.

	According to Malone.	According to Chalmers.
Troilus and Cressida - - -	1602	1600
Measure for Measure - - -	1603	1604
The Winter's Tale - - -	1604	1601
King Lear - - -	1605	1605
Cymbeline - - -	1605	1606
Macbeth - - -	1606	1606
Julius Cæsar - - -	1607	1607
Antony and Cleopatra - - -	1608	1608
Timon of Athens - - -	1609	1601
Coriolanus - - -	1610	1609
Othello - - -	1611	1614
The Tempest - - -	1612	1613
Twelfth Night - - -	1614	1613

Besides the above thirty-five plays, Shakspeare wrote some poetical pieces, which were at first published separately, *viz.* "Venus and Adonis," printed in 1593; "The Rape of Lucrece," 1594; "The Passionate Pilgrim," printed in 1599; "A Lover's Complaint," not dated; and a Collection of Sonnets, printed in 1609. The first and second of these poems were dedicated, as "the first heir of my invention," to Henry Wriothesley, earl of Southampton; who, according to Sir William d'Avenant's statement, presented the poet with the sum of 1000*l.* to make some purchase. If this be a fact, it is honourable to the liberality and good taste of the nobleman, and shews that the "poor Warwickshire lad" met with a munificent patron in an early stage of his literary career. Other circumstances tend to prove that his merits were known to, and admired by, some illustrious personages. Queen Elizabeth, whose ear was perpetually assailed by fulsome panegyric, and who encouraged all sorts of silly shows, May-games, and buffooneries, was not insensible of Shakspeare's talents; for she commanded several of his plays to be acted before her: and having been much delighted with the character of Falstaff, as delineated in the first and second parts of "Henry the Fourth," recommended, or perhaps commanded, the bard to portray the fat knight in love. Hence originated "The Merry Wives of Windsor;" some incidents in which may have pleased the daughter of Henry VIII., although they are justly repulsive to modern taste and delicacy. King James I. also attended the representation of many of our author's plays. Sir William d'Avenant told Sheffield, duke of Buckingham, that the monarch wrote the poet "an amicable letter" with his own hand; probably to thank him for the compliment contained in the play of Macbeth.

Shakspeare, as already hinted, was an actor, as well as author of plays, and performed some of the characters in his own dramas. As late as the year 1603, only 13 years before his death, his name appears among the players of Ben Jonson's tragedy of Sejanus. Thus it is evident that he continued to perform many years; but of his histrionic merits we have no satisfactory evidence. Hence on this point there is much diversity of opinion; some contending that he was an excellent actor, and others that he was only equal to the personification of his own character of the ghost in Hamlet. Some passages in his own writings prove that he was well qualified to appreciate and to describe the essentials of good acting. See Hamlet's admirable advice to the players; the scene between Hamlet and his mother; and also the description of a tragedian in "King Richard III." Aubrey states that Shakspeare visited his native town periodically; but we do not learn when he finally returned home. From a document in the possession of Mr. R. B. Wheler, the historian of Stratford, it appears that he was in London in November, 1614. At that time Mr. Thomas

Green, a professional gentleman of that town, and a relative of Shakspeare's, visited the metropolis, to obtain an act of parliament, or to settle some business relating to the inclosure of an open field, in which our poet was a party concerned. His memorandums are;

"Rec. 16. No. 1614, at 4 o'clock afr. noon, a lre from Mr. Bayly & Mr. Alderman, [the bailiff and chief alderman of Stratford-upon-Avon] dated 12. No. 1614, touchyng the inclosure busynes. Jovis 17. No. [1614] my cosen Shakspeare comyng yesterdy to town, I went to see him how he did. He told me that they" [the parties wishing to inclose] "assured him they ment to inclose no further than to Gospel bush, & so upp straight (leaving out pt. of the Dyngles to the field) to the gate in Clopton hedg & take in Salisbury's peece; & that they mean in Aprill to fvey. the land & then to gyve satisfaccion & not before: & he & Mr. Hall" [Shakspeare's son-in-law, probably present] "say they think yr. [there] will be nothyng done at all." It appears that Mr. Green, after his return to Stratford, made the following entry, which is partly illegible. "23. Dec. [1614] a Hall. lres. wrytten, one to Mr. Manyng—another to Mr. Shakspeare, with almost all the company's hands to eyther. I also wrytte myself to my csn. [cousin] Shakspear, the coppinges of all our then also a note of the inconvenyences wold by the inclosure." Another part of the memorandum states, that the town of Stratford was then "lying in the ashes of desolation."

We find that Shakspeare had purchased a house, called "New-place," at Stratford, about three years before his death, where he resided in the style and character of a private gentleman. Here he died on the anniversary of his birth-day, April 23, 1616, and was interred on the second day after his death, in the chancel of Stratford church, where a monument still remains to his memory. It is constructed partly of marble and partly of stone, and consists of a half-length bust of the deceased, with a cushion before him, placed under an ornamental canopy, between two columns of the Corinthian order, supporting an entablature. Attached to the latter is the Shakspeare arms and crest, sculptured in bold relief. Beneath the bust are the following lines:

Judicio Pylvm, genio Socratem, arte Maronem,
Terra tegit, popvlvs mæret, olympus habet.

Stay, passenger, why goest thou by so fast,
Read, if thou canst, whom envious death hath plapt
Within this monvment, Shakspeare: with whome
Quick natvre dide; whose name doth deck ys tombe
Far more than coste; sieh all yt he hath writt
Leaves living art, bvt page to serve his witt.

Obiit Ano. Doi. 1616, Ætatis 53, die 23 Ap.

On a flat stone, covering the grave, is this curious inscription:

Good frend for Jevs' sake forbear,
To digg the dvst encloused heare;
Blest be ye man yt spares these stones,
And cvrst be he yt moves my bones.

The common tradition is, that the four last lines were written by Shakspeare himself; but this notion has perhaps originated solely from the use of the word "my," in the last line. The imprecation, says Mr. Malone, was probably suggested by an apprehension "that our author's remains might share the same fate with those of the rest of his countrymen, and be added to the immense pile of human bones deposited in the charnel-house at Stratford."

Mrs.

Mrs. Shakspeare, who survived her husband eight years, was buried between his grave and the north wall of the chancel, under a stone inlaid with brass, and inscribed thus: "Heere lyeth interred the bodye of Anne, wife of Mr. William Shakspeare, who depected. this life the 6th day of Augvst, 1623, being of the age of 67 yeares."

Vbera, tv Mater, tv lac vitamq. dedisti,
Væ mihi; pro tanto mvnere faxa dabo!
Qvam Mallem, amoveat lapidem, bonvs angel'ore'
Exeat vt Christi Corpvs, imago tva,
Sed nil vota valent, venias cito Christe refvrges,
Clavsa licet tvmvlo mater, et aftra petet.

The family of Shakspeare, as already mentioned, consisted only of one son and two daughters. The son died in 1596; but both the daughters survived their father. The eldest, Susanna, married Dr. John Hall, a physician of Stratford, who is said to have obtained much reputation and practice. She brought her husband an only child, Elizabeth, who was married, first to Thomas Nashe, esq. and afterwards to Sir John Barnard, of Abingdon, in Northamptonshire; but had no issue by either of them. Judith, Shakspeare's second daughter, married Thomas Quiney, a gentleman of good family, by whom she had three children; but as none of them reached their twentieth year, they left no posterity. Hence our poet's last descendant was lady Barnard, who was buried at Abingdon, Feb. 17, 1669-70. Dr. Hall, her father, died Nov. 25, 1635, and her mother July 11, 1649; and both were interred in Stratford church under flat stones, bearing inscriptions to their respective memories.

Shakspeare, by his will, yet extant in the office of the prerogative court in London, and bearing date the 25th day of March, 1616, made the following bequests.

To his daughter Judith he gave 150*l.* of lawful English money; one hundred to be paid in discharge of her marriage portion, within one year after his decease, and the remaining fifty upon her giving up, in favour of her elder sister, Susanna Hall, all her right in a copyhold tenement and appurtenances, parcel of the manor of Rowington. To the said Judith he also bequeathed 150*l.* more, if she, or any of her issue, were living three years from the date of his will; but in the contrary event, then he directed that 100*l.* of the sum should be paid to his niece, Elizabeth Hall, and the proceeds of the fifty to his sister, Joan, or Jone Hart, for life, with residue to her children. He further gave to the said Judith a broad silver gilt bowl.

To his sister Joan, besides the contingent bequest above-mentioned, he gave twenty pounds and all his wearing apparel; also the house in Stratford, in which she was to reside for her natural life, under the yearly rent of twelve pence. To her three sons, William Hart, — Hart, and Michael Hart, he gave five pounds a-piece; to be paid within one year after his decease. To his grand-daughter, Elizabeth Hall, he bequeathed all his plate, the silver bowl above excepted.

To the poor of Stratford he bequeathed ten pounds; to Mr. Thomas Combe, his sword; to Thomas Russel five pounds; to Francis Collins, esq. thirteen pounds six shillings and eight-pence; to Hamlet (Hamnet) Sadler twenty-six shillings and eight-pence, to buy a ring; and a like sum, for the same purpose, to William Reynolds, gent., Anthony Nash, gent., John Hemyng, Richard Burbage, and Henry Cundell, his "fellows;" also twenty shillings in gold to his godson, William Walker.

To his daughter, Susanna Hall, he bequeathed New-place, with its appurtenances; two messuages or tenements, with their appurtenances, situated in Henley-street; also all his "barns, stables, orchards, gardens, lands, tenements, and

hereditaments whatsoever, situate, lying, and being, or to be had, received, perceived, or taken within the towns, hamlets, villages, fields, and grounds of Stratford-upon-Avon, Old Stratford, Bishopton, and Welcombe, or in any of them, in the said county of Warwick; and also all that messuage or tenement, with the appurtenances, wherein one John Robinson dwelleth, situated, lying, and being in the Blackfriars, London, near the Wardrobe; and all my other lands, tenements, and hereditaments whatsoever: to have and to hold all and singular the said premises, with their appurtenances, unto the said Susanna Hall, for and during the term of her natural life; and after her decease, to the first son of her body lawfully issuing, and to the heirs male of the body of the said first son, lawfully issuing; and for default of such issue, to the second son of her body lawfully issuing, and to the heirs male of the body of the said second son lawfully issuing;" and so forth, as to the third, fourth, fifth, sixth, and seventh sons of her body, and their heirs male: "and for default of such issue, the said premises to be and remain to my said niece Hall, and the heirs male of her body lawfully issuing; and for default of such issue, to my daughter Judith, and the heirs male of her body lawfully issuing; and for default of such issue, to the right heirs of me the said William Shakspeare."

To the said Susanna Hall and her husband, whom he appointed executors of his will, under the direction of Francis Collins and Thomas Russel, esqrs. he further bequeathed all the rest of his "goods, chattels, leases, plate, jewels, and household stuff whatsoever," after the payment of his debts, legacies, and funeral expences; with the exception of his "second best bed with the furniture," which constituted the only bequest he made to his wife, and that by insertion after the will was written out.

Among the mysteries connected with our poet's private life and actions is one, which has hitherto escaped the inveterate researches and countless opinions of his biographers and commentators. We have already seen, that his wife bore him three children in less than two years after marriage. In the Stratford register is an entry of "Thomas Greene, *alias Shakspeare*," in 1589-90, which excites some suspicion respecting the fidelity of our bard's wife: and it may be inferred from his will, that his lady could not have enjoyed much of his affection, to have been put off with only the bequest of a "second best bed:" besides, we do not hear of any other children by the poet.

The first collection of Shakspeare's plays was published in 1623, with the following title: "Mr. William Shakspeare's Comedies, Histories, and Tragedies. Published according to the true original copies. London, printed by Isaac Jaggard and Ed. Blount, 1623, folio." This volume was edited by John Hemyng and Henry Condell, and was dedicated to "the most noble and incomparable pair of brethren," William, earl of Pembroke, and Philip, earl of Montgomery. In the title page is a portrait, said to be a likeness of the author, with the engraver's name, "Martin Droeshout, sculpsit, London;" and on the opposite page are these lines by Ben Jonson, addressed to the reader:

"This figure that thou here seest put,
It was for gentle Shakspeare cut,
Wherein the graver had a strife
With nature to outdoo the life:
O, could he but have drawne his wit
As well in brasse, as he hath hit
His face; the print would then surpasse
All that was ever writ in brasse.
But, since he cannot, Reader, looke
Not on his picture, but his Booke." B. I.

The

SHAKSPEARE.

The above volume was carefully reprinted, in close imitation of the original, a few years back, by J. Wright, for Vernor and Hood, London. A second edition of Shakspeare's plays was published, in folio, in 1632, a third in 1664, and a fourth in 1685. These several impressions are usually denominated "ancient editions," because published within the first century after the death of the poet, and before any comments or elucidations were employed to expound the original text. Some of his dramas were published, in 4to., during his own life.

Of those editions which are distinguished by the title "modern," the earliest was published by Nicholas Rowe, in 1709, in 7 vols. 8vo. This was followed by an edition in 9 vols. 12mo. by the same author, in 1714; and to both were prefixed a biographical memoir of the illustrious bard. In 1725, Pope, who first introduced critical and emendatory notes, published his edition in 6 vols. 4to. with a preface, which Johnson characterizes as valuable alike for composition and justness of remark. A second edition by the same editor was published in 10 vols. 12mo. with additional notes and corrections, in 1728. The successor of Pope was Theobald, who produced a very elaborate edition in 7 vols. 8vo. in 1733; and a second, with corrections and additions, in 8 vols. 12mo. in 1740. Sir Thomas Hanmer next turned his attention to the illustration of Shakspeare, and in 1744 gave the world an edition of his plays in 6 vols. 4to. Warburton published his edition in 8 vols. 8vo. in 1747; from which time no critic attempted the task till the year 1765, when Dr. Johnson's first edition made its appearance in 8 vols. 8vo. It was preceded by an able and ingenious preface, in which the character of Shakspeare's writings are commented on in a powerful style of eloquence, but with a severity far removed from accuracy and justice. Indeed Johnson did not fully understand the varied merits of his author. In 1766, Steevens published the twenty "Old Plays," in 4 vols. 8vo. This was followed, in 1768, by an edition in 10 vols. crown 8vo. by Mr. Capell. Next came out, in 1771, a second and improved edition in 6 vols. 4to. by Sir Thomas Hanmer, which was succeeded by an edition in 10 vols. 8vo. in 1773, by Johnson and Steevens, conjointly. Of this last, a second edition was published in 1778; a third, revised and corrected by Reed, in 1785. In the year following was produced the first volume of the dramatic works of Shakspeare, with notes by Joseph Rann, A.M. which work was completed in 6 vols. 8vo. in 1794. In 1784 was published, in 1 vol. royal 8vo. an edition by Stockdale, with a very copious index of passages, by the Rev. Mr. Ayscough. Bell's edition appeared in 1788, in 20 vols. 18mo.; and in 1790 Malone's was ushered into the world in 10 vols. crown 8vo. In 1793, a fourth edition, "revised and augmented," in 15 vols. 8vo. was produced by Mr. Steevens. A fifth edition, in 21 vols. 8vo. was published in 1803, from the text and with the notes of Johnson, Steevens, and Reed; and another edition of 21 vols. with corrections, &c. appeared in 1813.

Many other impressions of our author's plays have been published by different booksellers, in different sizes, and of various degrees of typographic merit. Most of them, however, are unauthenticated reprints: but many have the popular attraction of embellishments. The most splendid of this class was published by Boydell, in 9 vols. folio, embellished with 100 engravings, executed by and from artists of the first eminence. The same work was also printed in 4to. In 1805 was published an edition of Shakspeare's plays in 10 vols. 8vo., with a prefatory essay by Alexander Chalmers, F.S.A. and a print to each play from a design by Henry Fuseli, esq. R.A. The last edition of this kind

VOL. XXXII.

has just appeared in 7 vols. 18mo. with 230 engravings on wood, from the tasteful press of Whittingham.

Steevens estimated, at the time he published his notes on Shakspeare, that "not less than 35,000 copies of our author's works" had been then dispersed; and it may now be confidently said, that nearly 100,000 of them have been printed and sold.

From what has been already stated, it is evident that the writings of Shakspeare have progressively acquired considerable publicity; and that they now rank as chief, or in the first list, of British classics. This high celebrity is to be attributed to various secondary causes, as well as to their own intrinsic merits. To players, critics, biographers, and artists, a large portion of this popularity is to be ascribed; for had the plays been represented by Garrick, Kemble, &c. as originally published by Condell and Hemmynge, or reprinted verbatim from that text, the spectators to the one, and readers of the other, would have been comparatively limited. It is talent only that can properly represent and appreciate talent. The birth and productions of one man of brilliant genius, will stimulate the emulation, and call into action the full powers of a correlative mind. Hence the British theatrical hemisphere has been repeatedly illumined by the coruscations of Garrick, Henderfon, Pritchard, Kemble, Siddons, Cooke, Young, and Kean; and these performers have derived no small portion of their justly acquired fame from the exquisite and powerful writings of the bard of Avon. Whilst the one may be considered as the creator of thought and inventor of character, the others have personified and given "local habitation" and existence to the poetical vision. The painter has also been usefully and honourably employed in delineating incidents, and portraying characters from the poet: while the engraver has translated these designs into a new language, and given them extensive circulation and permanent record.

The consummate acting of Garrick tended, in a great degree, not only to revive the fame of Shakspeare, but to augment and extend it. The peculiar powers of Betterton, and of his other dramatic predecessors, have not been sufficiently defined to enable us to estimate their real talents; but those of the English Roscius have been commented on and described by so many able critics, that we are certain they were of the most accomplished kind. He was therefore amply qualified to personify, and give life and effect to the characters of Macbeth, Hamlet, Lear, Richard the Third, Romeo, &c.; and by his exquisite representation of these histrionic personages, the public were additionally delighted and astonished with the amazing genius of the author. Since Garrick's time other actors have judiciously chosen some of Shakspeare's characters, as best calculated to shew their own talents; and as the most certain touchstone of passion. A Kemble and a Siddons have entwined their brows with never-fading laurel by diligently studying and successfully personating many of our poet's great characters. As the former has acquired a well-earned fame in portraying Macbeth, Lear, Coriolanus, Prospero, Cardinal Wolsey, Richard, Hamlet, and Othello; the latter has astonished and gratified many thousand spectators by her horrifying representation of lady Macbeth, her dignified playing of the queen in Henry VIII., and the queen in Hamlet; by her commanding powers in Portia; and in her pathetic eloquence of Desdemona. Cooke displayed the characters of Richard the Third, Iago, and Shylock, with great skill and excellence: and in the present day, Kean has personated these characters, with that of Richard II. and Hamlet, so as to command the approbation of the most acute and intelligent critics.

SHAKSPEARE

The number, variety, and versatility of commentaries that have been successfully published on the text of Shakspeare's plays almost exceed credibility; and a foreigner, or stranger to the subject, would be more than astonished, were the whole brought in one mass before him. It is true, that many of them are unimportant and useless, but it is equally true, that several of his critical annotators have displayed much research, learning, and acuteness; and to such the philologist and poetical antiquary are much indebted. It was our intention to have given a concise account of these; because the whole constitute the Shakspearian library; and all may be regarded as satellites to the vast and resplendent poetical planet. The chief editors of his plays have been already noticed, as well as the respective eras of their different writings. Rowe was the first to add any thing to the original text, by prefixing a memoir of the author. This memoir has been reprinted with almost every succeeding edition, and without any alteration or comment, till Malone accompanied it with notes to his edition of 1790. Mr. Alexander Chalmers, in an edition of 1805, has prefixed a "Sketch of the Life of Shakspeare," in which he has adopted most of the statements of Rowe, with the additional and corrective remarks of Malone and Steevens. "The whole, however," he remarks, "is unsatisfactory. Shakspeare in his private character, in his friendships, in his amusements, in his closet, in his family, is no where before us."

The plays of Shakspeare are divided into three classes, and called in the first edition "comedies, histories, and tragedies." Each is of a distinct character; but in some of them there is a mixture of the three in one. "The Merry Wives of Windsor," "The Comedy of Errors," and "The Taming of the Shrew," are all comedies; the rest have something of both kinds. It is not easy to determine in which way of writing he most excelled. His Falstaff is universally allowed to be a master-piece: the character is always well sustained, though drawn out into three plays; and even the account of his death, given by his landlady, Mrs. Quickly, in the first act of Henry V. is as natural and diverting as any part of his life. "If there be any fault," says the critic, "in the draught he has made of this lewd old fellow, it is, that though he has made him a thief, a liar, and a coward, and, in short, every way vicious, yet he has given him so much wit, as to make him almost too agreeable; and I do not know whether some people have not, in remembrance of the amusement which he had formerly afforded them, been sorry to see his friend Hal use him so scurvily when he comes to the crown, in the end of the second part of Henry IV. Among other extravagancies in the 'Merry Wives of Windsor,' he has made him a deer-stealer, that he might have the opportunity of remembering his Warwickshire prosecutor under the name of Justice Shallow." The whole play is admirable, the humours are various and well opposed; the main design, which is to cure Ford of his unreasonable jealousy, is extremely well conducted.

Another of the characters which has been fixed on as one of Shakspeare's fine delineations, is that of Shylock, the Jew, in "The Merchant of Venice," in which there appears such a deadly spirit of revenge, such a savage fierceness, and such a bloody designation of cruelty and mischief, as cannot agree either with the style or character of comedy, though usually ranked as such. Taken altogether, it is perhaps one of the most finished of Shakspeare's pieces; the tale indeed is improbable in some of its parts; but taking the facts for granted, the story is beautifully written. There is something in the friendship of Antonio and Bassanio very great and generous. The whole

fourth act is extremely fine, but there are two passages that are universally known and applauded, the one is in praise of *mercy*, and the other is on the power of *music*.

The melancholy of Jaques in the comedy of "As you like it," is as singular and odd, as it is amusing, and if, according to the maxim of Horace,

"Difficile est proprie communia dicere,"

it will be a hard task for any one to go beyond him in the description of the several degrees and ages of a man's life. See the article AGE.

His images are indeed every where so lively, that the thing he would represent stands full before you, and you possess every part of it. Rowe mentions his image of Patience, in the person of a young woman in love, as one of the finest and most uncommon things ever written; it is as follows:

"————— She never told her love;
But let concealment, like a worm i'th' bud,
Feed on her damask cheek: she pin'd in thought,
And sat like PATIENCE on a monument
Smiling at grief."

The style of his comedy is, in general, natural to the characters, and easy in itself; and the wit most commonly sprightly and pleasing, except in those places where he runs into doggerel rhimes. But the greatness of this author's genius does no where so much appear, as where he gives his imagination the entire loose, and raises his fancy to a flight above mankind, and beyond the limits of the visible world. Such are his attempts in the Tempest, Midsummer Night's Dream, Macbeth, and Hamlet. Of these, the Tempest is thought by able critics to be the most perfect in its kind of anything that Shakspeare has left behind him. His magic hath something in it very solemn, and very poetical: and that extravagant character of Caliban is extremely well sustained, and shews a wonderful invention in the author, who could strike out such a particular wild image, and it is certainly one of the finest that was ever exhibited to the human imagination. It has been said by able judges, that "Shakspeare had not only found out a new character in his Caliban, but had also devised and adapted a new manner of language for that character."

It is the same magic that raises the fairies in the Midsummer Night's Dream, the witches in Macbeth, and the ghost in Hamlet, with thoughts and language so proper to the parts they sustain, and so peculiar to the talent of this writer. "If," says the author whom we have so often quoted, "one undertook to examine the greatest part of his tragedies by those rules which are established by Aristotle, and taken from the model of the Grecian stage, it would be no difficult task to find a great many faults; but as Shakspeare lived under a kind of mere light of nature, and had never been made acquainted with the regularity of those written precepts, so it would be hard to judge him by a law of which he was ignorant. We are to consider him as a man, that lived in a state of almost universal licence and ignorance; there was no established judge, but every one took the liberty to write according to the dictates of his own fancy. When one considers, that there is not one play before him of a reputation good enough to entitle it to an appearance on the present stage, it cannot but be a matter of great wonder, that he should have advanced dramatic poetry as far as he did.

"It is now a received article of literary faith in England, that notwithstanding the faults and defects with which Shakspeare abounds, and which were chiefly those of his age, no dramatist in any country has displayed such intimate

SHAKSPEARE.

intimate knowledge of the human heart; such extensive acquaintance with nature in its various forms, an imagination so powerful and poetical, and such a copiousness of moral sentiment expressed in the most forcible language." Dryden says, "he was a man, who, of all modern and, perhaps, ancient poets, had the largest and most comprehensive soul. All the images of nature were still present to him, and he drew them not laboriously, but luckily. When he describes any thing, you more than see it, you feel it too. He needed not the spectacles of books to read nature; he looked inwards, and found her there. I cannot say he is every where alike; were he so, I should do him injury to compare him with the greatest of mankind. He is many times flat and insipid: his comic wit degenerating into clenches, his serious swelling into bombast. But he is always great, when some great occasion is presented to him. No man can ever say, he ever had a fit subject for his wit, and did not then raise himself as high above the rest of the poets,

"Quantum lenta solent inter viburna cupressi."

Shakspeare, like most men of pre-eminent talents, is said to have been much assailed by the attacks of envious rivals, notwithstanding, that gentleness and good nature were the peculiar characteristics of his personal deportment. Among those who are said to have treated him with hostility was the celebrated Ben Jonson; but Dr. Farmer departs from the received opinions on this subject, and thinks that, though Jonson was arrogant of his scholarship, and publicly professed a rivalry of Shakspeare, he was in private his friend and associate.

Pope, in his preface, says, that Jonson "loved" Shakspeare "as well as honoured his memory; celebrates the honesty, openness, and frankness of his temper; and only distinguishes, as he reasonably ought, between the real merit of the author, and the silly and derogatory applauses of the players." Mr. Gilchrist, whose dramatic criticisms are generally profound and acute, has published a pamphlet, to prove that Jonson was never a harsh or an envious rival of Shakspeare; and that the popular opinion on this subject is founded in error. The following story respecting these two great dramatists is related by Rowe, and has been generally credited by subsequent biographers. "Mr. Jonson, who was at that time altogether unknown to the world, had offered one of his plays to the players, in order to have it acted; and the persons into whose hands it was put, after having turned it carelessly and superciliously over, were just upon returning it to him with an ill-natured answer, that it would be of no service to their company, when Shakspeare luckily cast his eye upon it, and found something so well in it, as to engage him first to read it through, and afterwards to recommend Mr. Jonson and his writings to the public."

The opposition or rivalry of Shakspeare and Jonson produced, as might naturally be expected, much contention, concerning their relative merits, between their respective friends and admirers; and it is not a little remarkable, that Jonson seems to have maintained a higher place in the estimation of the public in general than our poet, for more than a century after the death of the latter. Within that period Jonson's works are said to have passed through several editions, and to have been read with avidity, while Shakspeare's were comparatively neglected till the time of Rowe. This circumstance is in a great measure to be accounted for on the principle that classical literature and collegiate learning were regarded in those days as the chief criteria of merit. Accordingly Jonson's charge against Shakspeare was the

want of that species of knowledge; and upon his own proficiency in it, he arrogated to himself a superiority over him. That all classical scholars, however, did not sanction Jonson's pretensions, is certain; for among the greatest admirers of Shakspeare, was one of the most learned men of his age, the ever-memorable Hales. On one occasion, the latter, after listening in silence to a warm debate between Sir John Suckling and Jonson, is reported to have interposed by observing, "That if Shakspeare had not read the ancients, he had likewise not stolen any thing from them; and that if he (Jonson) would produce any one topic finely treated by any one of them, he would undertake to shew something on the same subject, at least as well written, by Shakspeare." A trial, it is added, being in consequence agreed to, judges were appointed to decide the dispute, who unanimously voted in favour of the English poet, after a candid examination and comparison of the passages produced by the contending parties.

In September, 1769, was celebrated the Shakspeare jubilee, at Stratford, under the direction of Garrick.

In pointing out the authorities for the preceding article, and noticing a few of the most interesting works that have been published in illustration of the writings of the "bard of Avon," we must conclude this essay, which may be deemed too prolix by some, and too brief by others. "Some Account of Shakspeare," by N. Rowe. Malone's, Steevens's, and Reed's "Prolegomena." "Remarks on the Life and Writings of W. Shakspeare," by John Britton, F.S.A. prefixed to Whittingham's edition of his plays, with wood-cuts, 1814. "A Guide to Stratford-upon-Avon," by R. B. Wheler, 12mo. 1814. "Critical, historical, and explanatory Notes on Shakspeare; with Emendations of the Text and Metre," by Zachary Grey, LL.D. two vols. 8vo. 1755. "Observations and Conjectures on some Passages of Shakspeare," by Thomas Tyrwhitt, esq. 8vo. 1764. "An Essay on the Learning of Shakspeare," by the Rev. Dr. Rich. Farmer, 8vo. Three editions of this were published by the author, and it has, since 1789, been reprinted in different editions of Shakspeare's plays. "An Essay on the Writings and Genius of Shakspeare, compared with the Greek and French dramatic Poets; with some Remarks upon the Misrepresentations of Mons. de Voltaire," by Mrs. Montagu, 8vo. A sixth edition of this eloquent and interesting volume was printed in 1810. "Essays on Shakspeare's Dramatic Characters," by W. Richardson, M.D. 8vo. 1812, are replete with judicious criticism and apposite comment. "Remarks, critical and illustrative, on the Text and Notes of the last Edition of Shakspeare," (1778,) by Mr. Ritson, 8vo. 1783. "An Inquiry into the Authenticity of certain miscellaneous Papers, published Dec. 24, 1795," &c. by Edmond Malone, Esq. 8vo. 1796. This inquiry called forth two vols. called "An Apology for the Believers in the Shakspeare Papers," by G. Chalmers, 8vo. 1797: and a "Supplemental Apology for the Believers, &c." by the same author, 8vo. 1799. "Illustrations of Shakspeare, and of ancient Manners, &c." by Francis Douce, 2 vols. 8vo. 1807, is a work of very considerable merit.

Shakspeare was fond of music, and not wholly ignorant of the art. He not only frequently introduces *maques for music* in his plays, but singing in almost all his fourteen comedies; and even in most of his tragedies, where this wonderful and exquisite dramatist has manifested the same predilection for music as poetry.

In the "Tempest," the use that he has made of it is admirable, as well as the description of its effects. Act i. sc. 5. Ariel, invisible, playing and singing to Ferdinand, says,

SHAKSPEARE.

"Where should this music be, i' th' air or earth?
It sounds no more: and sure it waits upon
Some god o' th' island."

And afterwards:

"This is no mortal business, nor no sound
That the earth owns: I hear it now above me."

Indeed, the serious part of this most fanciful play is very fortunately calculated for an opera. Shadwell, in the last century, made one of it, in the manner of what were then called operas on our stage. It has been performed of late years more as a musical masque, than opera or play, at Drury-lane, to the music of the late Mr. T. Linley, as it used to be to that of Dr. Arne, and others. The songs in this play, Dr. Wilson, who refet and published two of them, tells us, in his "Court Ayres, or Ballads," published at Oxford, 1660, that "Full fathom five," and "Where the bee sucks," had been first set by Robert Johnson, a composer contemporary with Shakspeare.

A&t ii. sc. 1. "Enter Ariel playing solemn music." We never could understand this indication: no music seems to be heard by the characters on the stage, nor do they take any notice of it through the whole scene. Afterwards, when with music and a song he acquaints Gonzalo of the danger he is in, his mission has meaning. "While you here do snoring lie," &c.

Even Caliban talks well about music:

"—the isle is full of noises,
Sounds and sweet airs, that give delight and hurt not."

Ariel never appears or is employed without music, which is sweetly described, and introduced with perfect propriety. Prospero calls for medicinal music:

"A solemn air, and the best comforter
To an unsettled fancy, cure thy brains."

"Midsummer Night's Dream."

A&t ii. sc. 5. "Come now a *roundel*, and a fairy song." If, as Dr. Gray says, a *roundel* is "a dance in a ring," a *roundelay* was the song and tune to such dance; as *ballad*, from *ballata*, Italian; so *roundelay*, from *rondelet*, old French, *rondeau*, modern.

The ideas and language of fairyism are wonderfully imagined and supported in this play; and the use assigned to music happy and fertile.

A&t iv. sc. 1. "Rural music, tongs, &c." Poker and tongs, marrow-bones and cleavers, salt-box, hurdy-gurdy, &c. are the old national instruments of music on our island.

Queen. "Music, ho! music: such as charmeth sleep."

Still music, meaning such soft and gentle music as tranquillizes, soothes, and lulls to music.

A&t v. sc. 1. In the list of sports ready for the nuptial feast of Theseus, is "the battle with the Centaurs; to be sung by an Athenian eunuch to the harp." This seems to imply a more ancient practice of castration for the voice than can be found in opera annals.

Speaking of Quince, in the clown's prologue, Hippolita says, "indeed, he hath play'd on his prologue, like a child on a recorder; a sound, but not in government."

Two songs alluded to in the last scene of this play are lost.

Oberon. "And this ditty after me
Singing and dance it trippingly."

Queen. "First rehearse this song by rote,
To each word a warbling note;
Hand in hand, with fairy grace,
Will we sing, and bless this place."

"Two Gentlemen of Verona."

Though this comedy furnishes fewer occasions for music than the two preceding dramas, yet musicians are employed in it as well as musical allusions. As Ben Jonson, in his masque of "Cynthia's Revels," speaks of the gamut or syllables of solmification, *ut, re, mi, fa, sol, la*, which psalm-singers had made well known to his audience; so Shakspeare, in this play, act i. sc. 3. introduces all the musical terms then in use: as, a *tune*, a *note*, a *light*, a *heavy tune*, *burden*, *melodious*, to *reach high*, *keep in tune*, *sing out*, *too sharp*, *too flat*, *concord*, *harsh descant*, *the mean base*, &c.

A&t iv. sc. last, there is a laboured description of the powers of poetry and music; Orpheus's lute, *concert*, spelt as now:

"—to their instruments
Tune a deploring *dump*,"—

or lament (*lamentatione*), sung by a wretched and forrowing lover in the *dumps*.

Sc. 2. A serenata, or notturno, is introduced:

"—now must I to her window,
And give some evening music to her ear."

Enter Musicians.

"—now, gentlemen,
Let's tune, and to it lustily."

Song. "Who is Sylvia? what is she?" &c.

"Measure for Measure."

Though this play has less music in it than the three preceding, yet at the beginning of act iv. a song, from his own *Passionate Pilgrim*: "Take, oh, take those lips away," is sung to Mariana by a boy, who is sent away on the arrival of the duke, in the character of a friar; when apologizing for the seeming levity of listening to music, she says:

"I cry you mercy, sir, and well could wish
You had not found me here so musical."

To which the duke answers:

"'Tis good; though music oft hath such a charm,
To make bad good; and good provoke to harm."

This is a heavy charge, which it would not have been easy for Shakspeare to substantiate, and does not very well agree with what he says in the "Tempest," of the *innocuous* efficacy of music. "Sounds and sweet airs, that give delight, and hurt not." Music may be applied to licentious poetry; but the poetry then corrupts the music, not the music the poetry. It has often regulated the movements of lascivious dances; but such airs heard, for the first time, without the song or dance, could convey no impure ideas to an innocent imagination; so that Montesquieu's assertion is still in force: that "music is the only one of all the arts, which does not corrupt the mind."

"Merchant of Venice."

A&t ii. sc. 1. A flourish of cornets when the Moorish prince comes in.

A&t ii. sc. 6. "The vile squeaking of the wry-neck'd fife."

A&t

SHAKSPEARE.

Act iii. sc. 2. "Let music sound, while he doth make
his choice;
Then, if he lose, he makes a swan-like
end,
Fading in music.
—— he may win;
And what is music then? then music is
As are those dulcet sounds at break of
day,
That creep into the dreaming bride-
groom's ear,
And summon him to marriage."

Music within.

A song while Bassanio examines the caskets:

"Tell me where is fancy bred," &c.

The passages in the fifth act of this interesting play are beautiful, numerous, and celebrated:

"And bring your music forth into the air," &c.

"—— soft skillness and the night
Become the touches of sweet harmony."

Jessica. "I am never merry when I hear sweet music."
This is the initial of a well-known, and now *proverbial*,
eulogium on modulated sound: "The man that has no
music in his soul," &c.

"As you like it."

Act ii. sc. 1. A song:

"Under the green-wood tree," &c.

Remarks on music by Jacques. Then another song:

"Blow, blow, thou winter's wind."

Music. Song: "What shall he have that kill'd the
deer?"

Song: "'Twas a lover and his lass."

Still music. Song: "Then is there mirth in heav'n."

Another song: "Wedding is great Juno's crown."

"Love's Labour's lost."

Act iii. Armado. "Warble child; make passionate
my sense of hearing."

This is a most beautiful and comprehensive request: none
of the fine arts can subsist, or give rapture, without *passion*.
Hence mediocrity is more intolerable in them than in other
inventions. Music without passion is as monotonous as the
tolling of a bell.

But no song is printed: though the author tells us there
is *singing*. Dr. Johnson says, "here is apparently a song
lost."

Music as for a masquerade.

Songs for spring and autumn:

"When daisies pied."—And, "When icicles hang
on the wall."

"Winter's Tale."

Two nonsensical songs, by the rogue Autolychus:

"When daffodils begin to peere."—"Jog on, jog on,
the footpath way."

"He's main musical." This Autolychus is the true an-
cient minstrel, as described in the old Fabliaux. See Gen.
Hist. Mus. vol. ii. p. 208.

A three-part catch, ready planned by the poet, and
another pedlar's song; "Will you buy any tape?"

"Twelfth Night."

Act i. sc. 1. This play opens with a beautiful eulogium
on music:

"If music be the food of love, play on," &c.

The use of *Evirati*, in the same manner as at present,
seems to have been well known at this time (about 1600).
For Viola says:

"—— I'll serve the duke;
Thou shalt present me as a *eunuch* to him,
It may be worth thy pains, for I can sing,
And speak to him in many sorts of music,
That will allow me very worth his service."

And the duke's sensibility to the power of music is dis-
closed in the first interview, when he says to Viola:

"—— thy small pipe
Is as the maiden's organ, shrill and sound,
And all its semblative—a woman's part.
I know thy constellation is right apt
For this affair;"——

supposing her to be a eunuch.

Act ii. sc. 3. The clown is asked for a love-song, and
sings:

"O mistress mine, where are you roaming?" &c. And
"What is love; 'tis not hereafter," &c.

Ibid. They sing a catch, beginning,

"Hold thy peace."

Sc. 4. Scraps of songs and catches are roared out by
Sir Toby, Sir Andrew, and clown, as "Three merry men
be we."—"Tilly, valley, lady!"—"There dwelt a man
in Babylon, lady, lady."—"O the twelfth day of De-
cember."—"Farewel, dear heart, since I must needs be-
gone."—"His eyes do shew his days are almost done."—"Shall I bid him go? what, an' if you do?"—"Shall I bid him go, and spare not? O no, no, no, you dare not." All these, probably, were well known in Shakspeare's time.

Sc. 5. The duke, who is as constant in his passion for
music, as for Olivia, says:

"—— give me some music now—
Now, good Cesario, but that piece of song,
That old and antique song, we heard last night;
Methought, it did revive my passion much;
More than light airs, and recollected terms
Of these most brisk and giddy-paced times:
—— how dost thou like this tune?—
It gives a very echo to the feat
Where love is thron'd."

Ibid. "—— the song we had last night—

—— it is old and plain;
The spinsters and the knitters in the sun,
And the free maids that weave their thread with
bones,
Do use to chaunt it: it is silly sooth,
And dallies with the innocence of love,
Like the old age."

Song: "Come away, come away, death."

Act iv. sc. 4. The clown, as elsewhere, is much ad-
dicted to singing. Song, by the clown:

"When that I was a little tiny boy," &c.
serves as an epilogue to this entertaining play.

SHAKSPEARE.

In "The Taming of the Shrew," no other use is made of music than to introduce minstrels at the wedding, and disguise Hortensio in the character of a man *well seen in music*, to facilitate his admission to the presence and courtship of Bianca; an expedient, however, which was unsuccessful.

More fragments of old ballads are here quoted than in any other of Shakspeare's plays; though, as Dr. Warburton said, "he seemed to bear the ballad-makers a very particular grudge, and often ridicules them with exquisite humour."

In "The Comedy of Errors," music has no admission or concern.

"Much ado about Nothing."

Music at the masquerade, act ii. sc. 2. And in Benedict's dainty description of such an all-accomplished woman as could ever incline him to wed, he adds to her qualifications, *music*: "—of good discourse, an *excellent musician*, and her hair of what colour it shall please God." Sc. 8.

Act ii. sc. 9. The song, "Sigh no more, ladies, sigh no more," is introduced by several reflections on music, and the affectation of fingers. Baltazar, the musician and servant to Don Pedro, was perhaps thus named from the celebrated Baltazarini, called "De Beaujoyeux," an Italian performer on the violin, who was in the highest fame and favour at the court of Henry III. of France, 1577. In the last act, sc. 8, the epitaph and song are beautiful, and well calculated for music.

"All's Well that ends Well."

Act i. sc. 5. Flourish of cornets for the king of France's entrance and exit.

Act iii. sc. 8. A tucket afar off. *Ibid.* A march afar off.

Act v. sc. 3. Sound trumpets.

Historical plays. "King John."

No music but trumpets and the din of war.

"King Richard II."

Act i. sc. 4. Military instruments are admirably described:

"—rous'd up with boist'rous untun'd drums,
And harsh resounding trumpets dreadful bray."

Ibid. Mowbray, duke of Norfolk, on being ordered into banishment, says:

"My native English, now I must forego;
And now my tongue's use is to me no more,
Than an untringed viol, or a harp;
Or, like a cunning instrument cas'd up,
Or being open, put into his hands
That knows no touch to tune the harmony."

Act ii. sc. 1. "—the tongues of dying men
Inforce attention, like deep harmony:
—more are men's ends mark'd, than their lives
before;
The setting sun, and *music in the close*,
As the last taste of sweets, is sweetest last——"

Ibid. sc. 3. Speaking of John of Gaunt's death:

"——all is said,
His tongue is now a stringless instrument."

Act v. sc. 10. Richard, in his prison, says:

"——Music do I hear?
Ha, ha! keep time: how sow'r sweet music is,
Where time is broke, and no proportion kept?"

Here he plays on musical terms for several lines.

All instruments played with the bow, in Shakspeare's time, were fretted, except violins.

In "The Taming of the Shrew," act ii. sc. 3, he could not resist the temptation of quibbling on the term *fret*.

"Frets call you them? quoth she: I'll fume with them."

"——then call'd me rascal, fidler,
And twangling *Jack*;"

alluding to a famous street musician of the time.

"First Part of Henry IV."

Act i. sc. 2. Falstaff says he's as melancholy as the "drone of a Lincolnshire bagpipe."

Act ii. sc. 3. "An I have not ballads made on you all, and sung to filthy tunes, let a cup of sack be my poison."

Act iii. sc. 3. "——thy tongue
Makes Welch as sweet as ditties highly penn'd,
Sung by a fair queen in a summer's bower,
With *ravishing division* to her lute."

"Second Part of Henry IV."

Induction. "——Rumour is a pipe,
Blown by surmises, jealousies, conjectures;
And of so easy and so plain a stop,
That the blunt monster with uncounted heads,
The still discordant wavering multitude,
Can play upon it."

We advanced no farther in hunting through the pleasant wilds of Shakspeare; but in dipping accidentally, the following passages struck us as worthy of notice.

"Henry V." Act i. sc. 2. There is a manifest allusion to the different parts of music.

"For government; though *high*, and *low*, and *lower*,
Put into *parts*, doth keep in one *consent*,
Congreeing in a full and natural close,
Like music."

In "Othello," act iv. sc. 13. Desdemona says:

"My mother had a maid, called Barbara;
She was in love; and he, she lov'd, prov'd mad (*false*),
And did forsake her: she had a song of *willow*,
An old thing 'twas, but it express'd her fortune,
And she died singing it. That song, to-night,
Will not go from my mind; I've much ado,
Not to go hang my head all o' one side,
And sing it like poor Barbara."

"King Lear," act i. sc. 7. "O, these eclipses portend these divisions! *fa, sol, la, mi*."

None of the commentators have hitherto been sufficiently skilled in music to see the meaning of these syllables in solmisation, which imply a series of sounds so unnatural, that ancient musicians prohibited their use. "Mi contra fa est diabolus." Shakspeare, however, shews by the context, that he was well acquainted with the property of the musical intervals contained in the tritonus, or sharp 4th, which consisting of three tones, without the intervention of a semitone, is extremely difficult to sing, and disagreeable when

when sung, if *mi*, or *fa*, is the last note of the phrase or passage.

SHAKSPEARE'S Cliff, or *High Cliff*, in *Geography*, a lofty cliff on the E. coast of England, in the county of Kent; so called from the beautiful description of it given by that poet in the tragedy of *King Lear*; 2 miles S. of Dover.

SHAKY, or **SHAKEN**, a natural defect in timber when it is full of splits or clefts, and will not bear the fastening, or when sawn into plank the caulking.

SHAL, in *Geography*, a district of Persia, in Balouchistan, the country of the Balouches, which is considered by some as a province distinct from Mekran (the ancient Gedrosia), and which commences at Koohinee (the hilly road), 25 miles N.E. of Bayla, or in N. lat. $26^{\circ} 35'$, and extends to Nooshky, 79 miles N.W. of Kelat, or in N. lat. 30° . This country is a confused mass of mountains, through which the road generally leads in water-courses. Flocks of sheep and cattle abound in every part of this country, and it also produces great quantities of wheat. It is divided into the two mountainous provinces of Jhalawan and Sarawan, the low country of Cutch Gandava to the E., and the provinces of Zuhree and Anund Dijel; and to these may be added the small districts of Shal and Mustung, lying N. of Kelat. Shalawan is the most southern province of Balouchistan, and Sarawan (which see) is the most northern province. Cutch Gandava, situated at the bottom of the mountain lying S.E. of Kelat, is about 150 miles long, and 40 or 50 broad. Its soil is rich, black, and loamy, and produces every species of grain, as well as cotton, indigo, madder, &c. Cutch Gandava exports great quantities of grain to the sea-ports of Curachee and Sonmeany, whence it is shipped to Muscat, the coast of Mekran, &c. Anund Dijel lies N. of Cutch Gandava: its climate is good, the soil excellent, and the productions abundant; so that the khan of Kelat derives a large revenue from this small district. Shal and Mustung are smaller than Anund Dijel, but they are remarkable for their fruits, which are excellent and cheap. The climate is warmer than that of Kelat; the soil is more sandy; but the grain and other products are the same. (See **ZUHREE**.) The capital of Balouchistan is Kelat, a town surrounded by a mud-wall, and containing 4000 houses, and about 7000 inhabitants, of whom about 500 are Hindoos. The bazar of Kelat is well supplied, and the town appears opulent, being frequented by merchants, and carrying on a considerable trade. N. lat. $20^{\circ} 6'$. E. long. $67^{\circ} 57'$.

SHALBERG, a mountain of Switzerland; 4 miles N. of Sargans.

SHALBERIS, a circar of Hindoostan, bounded on the N. by Goragot and Bettooriah, on the E. and S. by Bettooriah, and on the W. by Bettooriah and Dinagepour; about 18 miles from N. to S. and nearly as much from E. to W. The chief town seems to be Cartee.

SHALDEAH, a town of Hindoostan, in Bahar; 7 miles S.W. of Rotafgur.

SHALE, in *Natural History*, a variety of schistose clay: the first variety is denominated slate clay, the schiefer Thon of Werner. (See **CLAY**.) The second variety is bituminous slate, the brand schiefer of Werner, of a brownish-black, or blackish-brown, colour, appearing like bad coal; it is found in considerable stratified masses; lustre, 0 or 1; transparency, 0; fracture slaty; fragments tabular; hardness, 5; sp. gr. about 2,000; streak somewhat glossy; effervescing, though very slowly, with the mineral acids: feeling rather greasy; placed on burning coals, it burns with a weak flame and sulphureous smell, the residuum being light-

grey; it seems to differ from the former variety, in containing bitumen. Kirwan. See **TABULAR SPAR**.

The acid emitted from shale, during its calcination, uniting itself to the argillaceous earth of the shale, forms alum. About a hundred and twenty tons of calcined shale will make one ton of alum. The shale, after being calcined, is steeped in water, by which means the alum, which is formed during the calcination of the shale, is dissolved: this dissolved alum undergoes various operations, before it is formed into the alum of the shops. Watson's Chem. Eff. vol. ii. p. 315. See **ALUM**.

This kind of slate forms large strata in Derbyshire; and that which lies near the surface of the earth is of a softer and more shivery texture than that which lies deeper. It is also found in large strata, generally above the coal, in most coal counties of this kingdom. Dr. Short informs us, that the shale wastes the lead ore near it, by its strong acid; and that it corrodes and destroys all minerals near it, except iron or coal, of whose vitriol it partakes. See **SLATE**.

SHALG, in *Geography*, a town of Turkestan; 10 miles S. of Turkestan.

SHALLOP, **SHALLOOP**, or *Sloop*, is a small light vessel, with only a small main-mast, and fore-mast, and lug-sails, to haul up, and let down, on occasion.

Shallops are commonly good sailers, and are therefore often used as tenders upon men of war.

The French shallop is a large-decked sloop of burden, used in Holland and Flanders, having one mast, carrying a gaff-main-sail. On the fore-side of the mast, above the gaff, is a short spar projecting forwards; to which is bent a long narrow sail, the tack of which is made fast to the stem, and the sheet to the side near the shrouds. On the bow-sprit are set two or three jibs, and a small mast is often fixed abaft that carries a mizen.

SHALLOT, in *Gardening*, the common name of a very useful culinary plant. See **ALLIUM**.

To what has been said under the above head, it may here be necessary to add some improvements, which have since been made, in the culture of these small bulbous roots. As the habits of growth in roots of this nature differ greatly in the different forts, some requiring to be nearly or quite on the surface of the ground, while others stand in need of being a considerable depth below it, which has not been well attended to in the garden culture of such roots; it may be readily supposed that these have considerable influence and effect on the growth of such root crops. In consequence of finding that crops of this root generally became mouldy and perished, and that they were usually planted, from the directions of garden cultivators, at the depth of two or three inches from the surface; the injury, failure, and destruction of such crops, were naturally ascribed to this cause. A few bulbs or bunches of this root were consequently divided, as far as possible, into single buds or bulbs, and planted upon or rather above the surface of the ground, some very rich soil being placed underneath them, and the mould on each side raised to support them, until they became firmly rooted. This mould was then removed by means of a hoe, and the use of the watering-pot, and the bulbs of course left wholly out of the ground. The growth of the plants had now so near a resemblance to that of the common onion, as not readily to be distinguished from it, until their irregularity of form, the consequence of the numerous germs within each bulb, became evident. The forms of the bulbs, however, continued constantly different from all those raised in the ordinary method, being much more broad, but of less length. The crop was a great deal better in quality, and at the same time much

more abundant in quantity. It may consequently not be unworthy of the gardener's attention. See the Transactions of the Horticultural Society of London, vol. ii. p. 97.

SHALLOT Creek, in *Geography*, a river of North Carolina, which runs into the Atlantic, N. lat. $33^{\circ} 53'$. W. long. $78^{\circ} 28'$.

SHALLOW. See **SHOAL**.

SHALTOCH CAIRN, in *Geography*, a mountain of Scotland, in Ayrshire; 12 miles E. of Girvan.

SHAM, EL. See **DAMASCUS**.

SHAMADE, in *War*. See **CHAMADE**.

SHAMALAPALEAM, in *Geography*, a town of Hindoostan, in Coimbatore; 15 miles N.E. of Coimbatore.

SHAMARASHUP, a town of Hindoostan, in Coimbatore; 18 miles S.W. of Errood.

SHAMBE, a river of West Florida, which runs into Pensacola bay.

SHAMBLE, or **SHAMMEL**, in *Mining*, a term used to express a sort of nich, or landing place, left at certain distances in the adits of mines, and formed by a stage of boards. The method of digging the tin-mines in Devonshire, and some parts of Cornwall, is this; they sink their way in such a breadth as is sufficient for them to stand and work, and at every fathom they leave a square place vacant, to which the ore is to be thrown up with shovels as it is dug. This they do from cast to cast; that is, as far as a man can conveniently throw up the ore with his shovel. Thus the ore, as it is dug by the beelmen, is thrown up by the shovellers, who follow them from shamble to shamble, till it comes to the top of the mine. This, however, is but an inconvenient way, and the use of these shambles is generally supplied by a winder at the opening of the mine, which manages two buckets, the one of which is sent down empty, while the other is sent up full; and one man employed below to load, and another to empty. Phil. Trans. N^o 60. See **MINING**.

SHAMBLES, or **SHINGLES**, in *Geography*, a bank of sand in the English Channel, near the coast of Dorsetshire, about four miles E. by S. from Portland Bill, with 14 feet at low water.

SHAMBRIER, in the *Manege*, is a long thong of leather, made fast to the end of a cane, in order to animate a horse, and punish him, if he refuses to obey the rider.

SHAMBYPATAM, in *Geography*, a town of Hindoostan, in the Carnatic; 36 miles S. of Tanjore.

SHAMDARA, a town of Assam, on the Burhampooter; 65 miles N.W. of Gerghonge.

SHAME, in *Ethics*. See **PASSION**.

SHAMERAN, in *Geography*, a town of Curdistán; 18 miles S. of Sherezur.

SHAMMY, **CHAMMY**, or *Chamois*, a kind of leather, either dressed in oil, or tanned; much esteemed for its softness, pliancy, &c.

It is prepared from the skin of the chamois, or shamois, a kind of rupicapra, or wild goat, called also *isard*, inhabiting the mountains of Dauphiny, Savoy, Piedmont, and the Pyrenées. See **CHAMOIS**.

Besides the softness and warmth of the leather, it has the faculty of bearing soap without damage; which renders it very useful on many accounts.

In France, &c. some wear the skin raw, without any preparation. Shammy leather is used for the purifying of mercury; which is done by passing it through the pores of the skin, which are very close.

The true chamois leather is counterfeited with common goat, kid, and even with sheep-skins; the practice of which makes a particular profession, called by the French *chamois*.

sure. The last, though the least esteemed, is yet so popular, and such vast quantities of it are prepared, especially about Orleans, Marseilles, and Toulouze, that it may not be amiss to give the method of preparation.

Manner of Shamoising, or of preparing Sheep, Goat, or Kid-skins in Oil, in imitation of Shammy.—The skins, being washed, drained, and smeared over with quick-lime on the fleshy side, are folded in two lengthwise, the wool outwards, and laid in heaps, and so left to ferment eight days; or, if they had been left to dry after slaying, then fifteen days.

Then they are washed out, drained, and half dried; laid on a wooden leg, or horse, the wool stripped off with a round staff for that purpose, and laid in a weak pit, the lime of which had been used before, and has lost the greatest part of its force.

After twenty-four hours they are taken out, and left to drain twenty-four more; they are then put in another stronger pit. This done, they are taken out, drained, and put in again, by turns; which begins to dispose them to take oil; and this practice they continue for six weeks in summer, or three months in winter: at the end of which they are washed out, laid on the wooden leg, and the surface of the skin on the wool-side peeled off, to render them the softer; then made into parcels, steeped a night in the river, in winter more, stretched six or seven over one another, on the wooden leg, and the knife passed strongly on the flesh-side, to take off any thing superfluous, and render the skin smooth.

Then they are steeped, as before, in the river, and the same operation is repeated on the wool-side; they are then thrown into a tub of water, with bran in it, which is brewed among the skins till the greatest part sticks to them, and then separated into distinct tubs, till they swell, and rise of themselves above the water.

By this means the remains of the lime are cleared out; they are then wrung out, hung up to dry on ropes, and sent to the mill, with the quantity of oil necessary to scour them: the best oil is that of stock-fish.

Here they are first thrown in bundles into the river, for twelve hours, then laid in the mill-trough, and fulled without oil till they be well softened; then oiled with the hand, one by one, and thus formed into parcels of four skins each; which are milled and dried on cords a second time; then a third; and then oiled again, and dried.

This process is repeated as often as necessity requires; when done, if there be any moisture remaining, they are dried in a stove, and made up into parcels wrapped up in wool: after some time they are opened to the air, but wrapped up again as before, till such time as the oil seems to have lost all its force, which it ordinarily does in twenty-four hours.

The skins are then returned from the mill to the chamoiser, to be scoured; which is done by putting them in a lixivium of wood-ashes, working and beating them in it with poles, and leaving them to steep, till the ley hath had its effect; then they are wrung out, steeped in another lixivium, wrung again; and this is repeated till all the grease and oil be purged out. When this is done, they are half dried, and passed over a sharp-edged iron instrument, placed perpendicular in a block, which opens, softens, and makes them gentle; lastly, they are thoroughly dried, and passed over the same instrument again; which finishes the preparation, and leaves them in form of shammy.

Kid and goat-skins are shamoised in the same manner as those of sheep, excepting that the hair is taken off without the use of any lime; and that when brought from the

the mill, they undergo a particular preparation called *ramalling*; the most delicate and difficult of all the others. It consists in this, that, as soon as brought from the mill, they are steeped in a fit lixivium, taken out, stretched on a round wooden leg, and the hair is scraped off with the knife; this makes them smooth, and, in working, to cast a kind of fine knap. The difficulty is in scraping them evenly.

SHAMOKIN, in *Geography*, a town of Pennsylvania, in Northumberland county, containing 2027 inhabitants.

SHAMOKIN Creek, a river of Pennsylvania, which runs into the Susquehanna. N. lat. $40^{\circ} 51'$. W. long. $76^{\circ} 53'$.

SHAMZANGI, a town of Persia, in the province of Laristan.

SHANCORI, a town of Persian Armenia; 12 miles W.N.W. of Kanja.

SHANDECAN, Big, a town of New York, in the county of Ulster, 14 miles N.W. of Kingston.

SHANDECAN, Little, a town in the same county; 12 miles N.W. of Kingston.

SHANDYUNGULUM, a town of Hindoostan, in Baramaul; 8 miles E. of Namacul.

SHANEDI, a town of Nubia, on the right bank of the Nile; 45 miles S.W. of Nubia.

SHANGOLDEN, a small post-town of Ireland, in the county of Limerick; 115 miles W.S.W. from Dublin.

SHANGRA, a country of Africa, W. of Mocaranga.

SHANGRAPOY, a town of Hindoostan, in Marawar; 20 miles S.S.E. of Trumian.

SHANK, in *Conchology*, the Sanscrit name of that species of shell, which gives its name in Europe to this branch of natural history. French and other foreign writers spell the word *chank*. The easy substitution of a hard for a soft initial, has led to a supposition that conch may by early writers have been taken from the same source as shank, or even derived from it. The shank, or chank, or conch, is the large buccinum, and is often seen beautifully coloured like a pheasant's breast. With the Hindoos, the shank is an object of mystical reverence. It is seen in one of the four hands of their deity **VISHNU**, and is one of his commonest attributes. Images and pictures of him are indeed distinguished more by this than by any other mark. It has of course a fabulous or mythological origin; and we accordingly find it among the "fourteen gems" that were recovered from the ocean, after a general deluge, as related under the article **KURMAVATARA** of this work, where the shank is said to be "a shell conferring victory on any one who should found it." In the distribution of the precious articles, the shell seems to have fallen to the share of Vishnu.

Shells, as arousing implements, were much used in early Indian wars, as trumpets and drums are with us. In the terrible civil wars between the Pandus, and their kinsmen the Kurus, as Homerically described in the Mahabarat, Krishna used a shell named Panchajanya, obtained in the manner related under our article **KASYA**, from a sea-monster named *Sankasura*, which see. Each chief in the wars alluded to bore a shell, to which, like the swords of our chivalrous knights, distinct and significant names are given. In the portion of the Mahabarat translated by Mr. Wilkins, called Bhagavat Gita, the following passage occurs. "The ancient chief, and brother of the grand sire of the Kurus, then shouting with a voice like a roaring lion, blew his shell to raise the spirit of the Kuru chief; and instantly innumerable shells, and other warlike instruments, resounded on all sides,—the clangour was excessive. Krishna and Arjun, standing in a splendid chariot drawn by white horses,

founded their shells of celestial form; that blown by Krishna was named Panchajanya; Arjun's, Devadata. Bhim, of dreadful deeds, blew his capacious shell Powndra; and Yudishtira, the royal son of Koonti, founded Ananta-Vijaya. Nakal and Sahadeva blew their shells also, the one called Sugufha, the other Manipushpaka; so that their shrill sounding voices pierced the hearts of the Kurus, and echoed with a dreadful noise from heaven to earth." P. 29.

The shells in question are articles of commerce in India, to no inconsiderable extent. A chank fishery on the island of Ceylon is noticed by Mr. Cordiner. It is in the neighbourhood of Manaar, (see **MANAAR**), and yields, Mr. Cordiner says, a considerable revenue to government. The shells, he says, are brought from the depth of two fathoms by divers, who in a calm day can, from a boat, see them crawling at the bottom. Such as are of a spiral form are chiefly exported to Bengal, where they are sawed into rings of various sizes, and worn on the arms, legs, fingers, and toes of the Hindoos, both male and female. A chank opening to the right, that is with its spiral line contrary to its usual direction, is rarely met with, and is highly valued by mystics and zealots. They always sell, Mr. Cordiner says, for their weight in gold. History of Ceylon, vol. ii. p. 6.

Univalves of the sort here alluded to, called *heterostrophous* by conchologists, are very rarely of any species, and are looked on with admiration in all countries; but with the enthusiastic Hindoo in a degree unequalled. A Yogi, or Saniaffi of the Vaishnava sect, deems himself extremely happy in such an acquisition. The shell in question is frequently seen in the hands of itinerant holy beggars, and it is founded in some of the temples and religious ceremonies of the Hindoos.

SHANK of an Anchor, on board a Ship. See **ANCHOR**.

SHANK of a Horse, in the *Manege*, the name of that part of the fore-leg which is between the knee and the fetlock, or pastern joint. The larger and broader the shank is the better. It is known to be so, by the back sinew being at a distance from the bone, or well separated from it, and having no kind of swelling betwixt it and the bone, which may cause the leg to appear round.

SHANK, or *Shank-painter*, in a Ship, is a short chain fastened under the foremast-threads, by a bolt, to the ship's side; having at the other end a rope fastened to it. On this shank-painter the whole weight of the aft-part of the anchor rests, when it lies by the ship's side. The rope by which it is hauled up, is made fast about a timber-head. See **PAINTER**.

SHANK, Sheep, a sort of knot made on backstays, &c. to shorten them.

SHANKER, in *Medicine*. See **CHANKRE**.

SHANKLIN CHINE, in *Geography*, a ledge of rocks on the E. coast of the Isle of Wight, N. of Ludcomb Chine.

SHANMUKA, a name of a celebrated hero in *Hindoo Mythology*, more commonly called *Kartikya*; which see. The name Shanmuka means with six mouths or faces, he being so represented; the reason of which is given under the article referred to. See also **SESHTI-MATRIYA**, another of his names.

SHANNON, in *Geography*, the chief river of Ireland, and the largest in any island in the world. The name is supposed to be derived from the Irish words *shan*, old, and *avon*, a river. Other derivations, however, are given, all of which seem equally fanciful and uncertain; as the names of rivers are in general more ancient than even the names of the countries through which they flow. Ptolemy calls the Shannon *Senus*; Orosius, *Scena*; and Æthicus, *Secana*. It is called by Giraldus Cambrensis *Flumen Seneuse*; who

SHANNON.

also dignifies it, as Virgil did the Po, with the title of *Fluviorum Rex*. Spenser too celebrates

“The spacious Shenan spreading like a sea.”

And other poets have been eloquent in describing its majestic course, holy islands, and sublime scenery; but geographers are, in general, very brief, and sometimes contradictory in their accounts of this river. They do not even agree as to its source. According to Camden and Ware it rises in *Slieve-en-eron*, (*i. e.* the mountain of iron mines,) in the county of Leitrim; but Gough and Ferrar make it spring from the plains of Quilka, in the county of Cavan. Again, Dr. Beaufort says, Lough Clean is the fountain-head; while Boade, Pinkerton, and most other writers on the subject, make it Lough Allen. These differences, however, may be in some measure reconciled by observing, that Lough Allen receives the waters of the other sources above-mentioned, and that the Shannon does not take its name until it has passed this lake. As it is likewise the receptacle of most of the other current waters of the surrounding country, every stream that falls into it may claim some share in the disputed honour; but Lough Clean has the highest title, as contributing most largely by means of the river Duff. Lough Allen is nearly in the centre of the county of Leitrim; it is about twenty square miles in extent, and in some parts is said to be unfathomable. From this grand reservoir and copious spring, the Shannon issues in great force at a place called Balatnara. The direction, at first, is south and south-west, dividing the provinces of Leinster and Munster from Connaught. It passes Limerick, where it turns nearly to the west, and, sixty miles below this city, falls into the Atlantic ocean, between Kerry Head and Cape Lean, after a course of two hundred miles. It is navigable nearly to Limerick for ships of the greatest burden, and for smaller vessels throughout the whole extent of its course.

This noble river traverses several large lakes, and forms many extensive bays and estuaries, interspersed with beautiful islands. It receives above thirty other rivers in its course, and diffuses verdure and fertility over the banks of ten counties; namely, Leitrim, Roscommon, Galway, and Clare, on the right; and on the left, Longford, Westmeath, King's County, Tipperary, Limerick, and Kerry.

The principal towns situated on its banks are Leitrim, Carrick, Jamestown, Laneshorough, Athlone, Banagher, Portumna, Killaloe, Castleconnel, Tarbert, and Kilrush; besides the city of Limerick, which it encompasses by different branches, and in some measure insulates.

The largest lakes which it passes through are, Lough Boffin, Lough Ree or Regith, and Lough Derg or Dergart. The first, which is about ten square miles in extent, is situated at the confines of the counties of Leitrim, Longford, and Roscommon. Lough Ree extends nearly from Laneshorough to Athlone, a distance of about sixteen miles, and is from two to five miles in breadth. It contains above fifty islands, many of which are covered with wood and good pasturage. Lough Derg is eighteen miles long, and from two to seven broad. It is diversified with about sixty islands, one of which, called Innismore, contains above a hundred acres of good land; and on another, called the Holy Island, are the ruins of seven churches, and a round tower. This lake extends nearly from Portumna to Killaloe. There is also below Limerick, at the confluence of the Fergus river, an immense estuary, or firth, of many square miles in extent, interspersed with several rich and romantic islands.

The principal rivers that fall in from the right bank, or Connaught side, are the Key, Suck, Scariff, and Fergus. The confluence of the Key is at Carrick, and the Suck, which divides the counties of Roscommon and Galway, flows in at Clonfert above Banagher. Several smaller rivers fall in from the county of Galway; and from Clare flow the Scariff and Fergus; but the great weight of water comes from the other side by rivers running from east to west, which, it may be remarked, is different to the usual course in other parts of the world. The Inny is the first great river on the left bank: it is the boundary between the counties of Longford and Westmeath, and falls into Lough Ree, where it forms a large estuary. The second river on this side is the Great Brosna, which forms a fine confluence with the Shannon above Banagher; and the Lesser Brosna, united with the Birr river, falls in a few miles below that town. From hence to Limerick many smaller rivers flow in on the Ormond side, and below that city there are some larger ones: the principal are the Maig, Deel, Ovan, Cummage, Feale, Gale, and Cashin. Several of the above are navigable to a considerable distance from the Shannon.

From such an accumulation of rivers, lakes, and springs, the mouth of the Shannon is increased to an immense magnitude, being nearly ten miles in breadth, for the last fifteen miles, and from twenty to thirty fathoms deep. It is not only larger than any other insular river, but discharges much more water into the ocean than any continental stream whatever, running so short a distance as two hundred miles. Camden seems to credit a tradition, commonly believed in his time, of a gradual increase in the number and size of the lakes and rivers of Ireland. The supposition is curious, and may not be wholly unfounded.

As the Shannon from Limerick to the ocean is of great and increasing importance to the commercial world, we shall here give some particulars of its navigation from an hydrographical survey lately made. The distance is above sixty English miles, and the bearing nearly W. by S. The breadth of the river is various. If the length be divided into three parts, the first will be found to measure from one to three miles broad; the middle division increases to about six, and the third to ten miles in breadth. The soundings of the mouth have been already mentioned: they decrease towards Limerick; but in all parts the river is of considerable depth, and is remarkable for its transparency.

The tides in the mouth of the Shannon rise from nine to fourteen feet perpendicular height; and they increase as the river becomes narrower, inasmuch that at the pool of Limerick, they are from twelve to twenty feet high. The current of the tide varies considerably in different parts of the stream, running at the rate of from two to five miles an hour. It is not, however, perceptible far above the city, owing to several cataracts.

There are many fine bays on the Clare side, which afford safe anchorage and good shelter for shipping. The principal are Kilbahan, Carigahault, Clonderlaw, and Labisheda, besides the commodious harbour of Poolanishary, near Kilrush, and Tarbert bay on the Kerry side. It may be mentioned, that Kerry Head, also called Ballyheigh Point, is a long and narrow promontory; and that Cape Lean, or Loop Head, on the other side, is still narrower; having at its extremity a light-house, in N. lat. 52° 30'. W. long. 10° 20'.

The navigation between the Upper and Lower Shannon was formerly impeded by the noted cataract near Castleconnel, called the Salmon's Leap, but of late years canals have been drawn round this rock as well as others called the Falls. An important communication has been likewise opened between the Shannon and Dublin by means of the grand canal, which

which forms its junction above Banagher. (See our article CANAL.) It may be observed, that the Shannon nearly infulates Connaught with the county of Clare; and that if a canal, of about four miles in length, were cut from Lough Clean to the river Bonnet, which falls into Sligo bay, the infular boundary would be complete, and the Shannon rendered navigable from sea to sea.

The bridges over this river are chiefly at the forementioned towns, but there are none below Limerick. In this city there are three, one of which, called Thomond bridge, contains fourteen arches; and about ten miles higher is O'Brien's bridge, which has nineteen arches.

The fisheries on the Shannon are numerous and productive, particularly for salmon, which is of the finest flavour. Mr. Arthur Young, in his Tour through Ireland, p. 359, observes of this river, that "besides affording all sorts of wild fowl, the quantity and size of its fish are amazing. Pikes swarm and rise to the weight of 50lbs. each. Trout, bream, eel, gillaroos, &c. are large and abundant, and perch are so plentiful, that, in some years, the poor almost live upon them." It may be added, that not only river fish, but even such as are generally denominated pond and lake fish, abound here; so that what Spenser says of the Trent may be truly applied to the bounteous Shannon, which

— "Within itself enfeames
Both thirty sorts of fish, and thirty sundry streames."

The Shannon forms a very important subject in the ancient history of Ireland. Ptolemy mentions three large cities on its banks, called Regia, Macolicum, and Regia Altera. But his editors, Mercator and Ortelius, do not exactly agree in their maps as to the situations, and no vestiges remain to settle the question. The general opinion is, that Regia was on the east side of Lough Ree, and the names correspond, as *Ree* signifies a *king*, in the Irish language. Macolicum is supposed, from the name, to have been at Mellick, a village in the county of Galway, and Regia Altera at or near Limerick.

This river was of great political and military use before the English power was established in Ireland. It long served as a barrier between the territories of provincial kings, and not unfrequently was made the scene of naval engagements, particularly below Limerick. The following curious instance is recorded in the Annals of Munster, and quoted by Archdall. "This year (1065), Hugh O'Ruark, king of Briefne, in company with Thady O'Kelly, king of Maine, were defeated by Hugh O'Connor, king of Connaught, who totally overthrew their whole army, and sunk and dispersed their fleet on the Shannon." (Monasticon Hibernicum, p. 280.) Even in modern times this river has been occasionally found of great military importance. See our articles ATHLONE, and LIMERICK.

The islands on the Shannon add an interesting feature to the history of the early progress of Christianity in Ireland; particularly from the fourth to the eighth century, when that country enjoyed a repose unknown on the continent, and was famed the "*Insula Sacra et Sanctorum*," or, to use the words of Dr. Johnson, "the pious and hospitable school of the west." During that period many of those islands were dedicated to the service of religion, and numerous vestiges still are seen in the remains of churches, abbeys, and other monastic institutions. The holy island in Lough Derg has been already noticed, and there are many others of a similar description, which are still held in pious veneration by the multitude, and are much resorted to on certain festivals. We shall mention only another, which is Inniscattery, in the mouth of the Shannon, about twenty miles

from the ocean, and which is thus described by Archdall. P. 49.

"On the rich and beautiful island of Scattery, are the ruins of a monastery dedicated to St. Senan, who founded here an episcopal see about the time of St. Patrick. There are likewise the ruins of seven churches, out of eleven which were here in queen Elizabeth's time. An ancient round tower of one hundred and twenty feet in height, and in complete repair, graces the scene." For a more particular account of these "*Insula sacra Seni*," see Gough's Camden; also Ware, Wilfon, Archdall, &c.

The views of the Shannon are in many parts highly picturesque and sublime. We shall briefly notice three. The first is from a beautiful hill in Lower Ormond, called Knockshagowna, i. e. Oonagh's hill, so named as being the fabled residence of Oonagh, Spenser's Fairie Queen. From this eminence the river is seen to an extent of nearly twenty miles, apparently ascending in its course. The second is from the admired ruins of Carrick O'Gunnel, beyond Limerick; and the third from Knockpatrick, a lofty hill in the same county, and much nearer to the sea. It is celebrated by several writers as commanding the most grand and interesting prospect that can be imagined both of the river and the ocean. Among these authors may be mentioned Necham, an English poet and divine of the twelfth century; whose verses on the Shannon are thought worthy of quotation by Camden, and which we shall here transcribe, annexing a free translation.

"Fluminibus magnis lætatur Hibernia, Sineus
Inter Connatiam, Momoniamque fluit.
Transit per muros Limerici, Knoc Patric illum
Oceanus clausum sub ditione videt."

"Amid majestic streams, Hibernia's pride,
The noble Shannon bids her plains divide.
Leinster and Munster to the eastward bear,
With Connaught to the right, and lofty Clare;
By Lim'rick's walls he bends his lordly way,
While tributary streams their homage pay.
Till proud Knockpatrick views, from Desmond's coast,
This world of waters in the ocean lost."

SHANNON, a river of Canada, which runs into the N.E. part of lake Ontario.

SHANSCRIT, SANSKRIT, *Samscrit*, *Samscretam*, or *Hanscrit language*, is the original language of the Hindoos or Gentoos, in which their *Shastah*, or *Shaster*, is written, &c.

The grand source of Indian literature, the parent of almost every dialect, from the Persian gulf to the China seas, says the learned Halhed, in the Preface to his Grammar of the Bengal Language, is the Shanfcrit; a language of the most venerable and unfathomable antiquity, which, although at present shut up in the libraries of Bramins, and appropriated solely to the records of their religion, appears to have been current over most part of the oriental world; and traces of its original extent may still be discovered in almost every district of Asia. It is astonishing to find the similitude of Shanfcrit words with those of Persian and Arabic, and even of Latin and Greek; and those not in technical and metaphorical terms, which the fluctuation of refined arts and improved manners might have occasionally introduced; but in the main ground-work of language, in monosyllables, in the names of numbers, and in the appellations of such things as would be first discriminated in the immediate dawn of civilization. The coins of Assam, Napol, Cashmire, and many other kingdoms, are all stamped with

with Shanſcrit letters, and moſtly contain alluſions to the old Shanſcrit mythology: the ſame conformity is alſo obſervable in the impreſſions of ſeals from Bootan and Thibet. Beſides, the arrangement of the Shanſcrit alphabet is very different from that of any other quarter of the world. This extraordinary mode of combination ſtill exiſts in the greateſt part of the Eaſt, from the Indus to Pegu, in dialects now apparently unconnected, and in characters completely diſſimilar; and affords a forcible argument that they are all derived from the ſame ſource. Moreover, the names of perſons and places, of titles and dignities, which are open to general notice, and which are found even to the furtheſt limits of Aſia, preſent manifeſt traces of the Shanſcrit. Another circumſtance deſerves to be mentioned, and that is, that the raja of Kiſhenagur, a very learned and able antiquary of Bengal, affirmed, that he had in his own poſſeſſion books which give an account of a communication formerly ſubſiſting between India and Egypt, in which the Egyptians are deſcribed as diſciples, and not as inſtructors; and as ſeeking that liberal education and thoſe ſciences at Hindooſtan, which none of their own countrymen had ſufficient knowledge to impart. But though theſe ſeveral proofs of the former prevalence of the Shanſcrit are now thinly ſcattered over an immense continent, and interſperſed with an infinite variety of extraneous matter, ariſing from every poſſible revolution in the manners and principles of the nations who have by turns cultivated or deſtroyed it; that part of Aſia, between the Indus and the Ganges, ſtill preſerves the whole language pure and inviolate; ſtill offers a thouſand books to the peruſal of the curious, many of which have been religiously handed down from the earlieſt periods of human exiſtence.

H. T. Colebrooke, eſq. has given us in the Aſiatic Reſearches (vol. vii. p. 199, &c.), a literal tranſlation of two paſſages cited from a treatiſe on rhetoric, compiled for the uſe of Manicya Chandra, raja of Tirabhuṭi, or Tirlut, in which are enumerated the languages uſed by Hindoo poets. The firſt is as follows: "Sanſcrita, Pracrita, Paiſachi, and Magad'hi, are in ſhort the four paths of poetry. The gods, &c. ſpeak Sanſcrita; benevolent genii, Pracrita; wicked dæmons, Paiſachi; and men of low tribes and the reſt, Magad'hi. But ſages deem Sanſcrita the chief of theſe four languages. It is uſed three ways; in proſe, in verſe, and in a mixture of both." Again, "Language, the virtuous have declared to be fourfold, Sanſcrita, or the poliſhed dialect; Pracrita, or the vulgar dialect; Apabhranſa, or jargon; and Miſra, or mixed. Sanſcrita is the ſpeech of the celeſtials, framed in grammatical inſtitutes; Pracrita is ſimilar to it, but manifold as a provincial dialect, and otherwiſe; and thoſe languages which are ungrammatical, are ſpoken in their reſpective diſtricts." The Paiſachi, ſays Mr. Colebrooke, ſeems to be gibberish, which dramatic poets make the dæmons ſpeak, when they bring theſe fantaſtic beings on the ſtage. The mixture of languages, noticed in the ſecond quotation, is that which is employed in dramas, as is expreſſly ſaid by the ſame author in a ſubſequent verſe. It is not then a compound language, but a mixed dialogue, in which different perſons of the drama employ different idioms. Both the paſſages above quoted are therefore eaſily reconciled. They, in fact, notice only three tongues. 1. Shanſcrit, a poliſhed dialect, the inflexions of which, with all its numerous anomalies, are taught in grammatical inſtitutes. This the dramatic poets put into the mouths of gods, and of holy perſonages. 2. Pracrit, conſiſting of provincial dialects, which are leſs refined, and have a more imperfect grammar. In dramas it is ſpoken by women, benevolent genii, &c.

3. Magad'hi, or Apabhranſa, a jargon deſtitute of regular grammar. It is uſed by the vulgar, and varies in different diſtricts: the poets accordingly introduce into the dialogue of plays a provincial jargon, ſpoken by the loweſt perſons of the drama.

Sanſcrita is the paſſive participle of a compound verb, formed by prefixing the prepoſition *jam* to the crude verb *cri*, and by interpoſing the letter *s*, when this compound is uſed in the ſenſe of embellishment. Its literal meaning then is "adorned;" and when applied to a language, it ſignifies "poliſhed." *Pracrita* is a ſimilar derivative from the ſame crude verb, with *pra* prefixed: the moſt common acceptance of this word is "outcaſt, or man of the loweſt claſs;" as applied to a language, it ſignifies "vulgar." *Apabhranſa* is derived from *bhras*, to fall down: it ſignifies a word, or dialect, which falls off from correct etymology. Grammarians uſe the *Sanſcrita* as ſignifying "duly formed or regularly inflected;" and *Apabhranſa* for falſe grammar.

The languages of India are all comprehended in theſe three claſſes. The firſt contains Shanſcrit; a moſt poliſhed tongue, which was gradually refined until it became fixed in the claſſic writings of many elegant poets, moſt of whom are ſuppoſed to have flouriſhed in the century preceding the Chriſtian era. It is cultivated by learned Hindoos throughout India, as the language of ſcience and of literature, and as the repoſitory of their law, civil and religious. It evidently draws its origin (and ſome ſteps of its progreſs may even now be traced) from a primeval tongue, which was gradually refined in various climates, and became Shanſcrit in India; Pahlavi in Perſia; and Greek on the ſhores of the Mediterranean. Like other very ancient languages, Shanſcrit abounds in inflexions, which are, however, more anomalous in this, than in the other languages here alluded to; and which are even more ſo in the obſolete dialect of the Vedas, than in the poliſhed ſpeech of the claſſic poets. It has nearly ſhared the fate of all ancient tongues, and is now become almoſt a dead language; but there ſeems no good reaſon for doubting, that it was once univerſally ſpoken in India. Its name, and the reputed difficulty of its grammar, have led many perſons to imagine, that it has been refined by the concerted efforts of a few prieſts, who ſet themſelves about inventing a new language; not like all other tongues, by the gradually improved practice of good writers and polite ſpeakers. The exquisitely refined ſyſtem by which the grammar of Shanſcrit is taught, has been miſtaken for the refinement of the language itſelf. The rules have been ſuppoſed to be anterior to the practice, but this ſuppoſition is gratuitous. In Shanſcrit, as in every other known tongue, grammarians have not invented etymology, but have only contrived rules to teach what was already eſtabliſhed by approved practice.

There is one peculiarity of Shanſcrit compoſitions which may alſo have ſuggeſted the opinion, that it could never be a ſpoken language. Mr. Colebrooke alludes to what might be termed the euphonical orthography of Shanſcrit. It conſiſts in extending to ſyntax the rules for the permutation of letters in etymology. Similar rules for avoiding incompatible ſounds in compound terms exiſt in all languages; this is ſometimes effected by a deviation from orthography in the pronunciation of words, ſometimes by altering one or more letters to make the ſpelling correſpond with the pronunciation. Theſe rules have been more profoundly inveſtigated by Hindoo grammarians than by thoſe of any other nation, and they have completed a ſyſtem of orthography, which may be juſtly termed euphonical. They require all compound terms to be reduced to this ſtandard, and Shanſcrit authors, it may be obſerved, delight in compounds of inordinate

ordinate length; the whole sentence too, or even whole periods, may, at the pleasure of the author, be combined like the elements of a single word, and good writers generally do so. In common speech this could never have been practised. None but well-known compounds would be used by any speaker who wished to be understood, and each word would be distinctly articulated, independently of the terms which precede and follow it. Such indeed is the present practice of those who still speak the Shanscrit language; and they deliver themselves with such fluency as is sufficient to prove, that Shanscrit may have been spoken in former times with as much facility as the contemporary dialects of the Greek language, or the more modern dialects of the Arabic tongue.

The father of Shanscrit grammar, who first composed those grammatical institutes in which this language is formed, or by which words are correctly formed or inflected, was Panini, who lived in so remote an age, that he ranks among those ancient sages, whose fabulous history occupies a conspicuous place in the "Puranas," or Indian theogonies. According to the Pauranica legends, Panini was the grandson of Devala, an inspired legislator; but whatever may be his history, to him the Sutas, or succinct aphorisms of grammar, are attributed by universal consent.

His system is grounded on a profound investigation of the analogies in both the regular and the anomalous inflexions of the Shanscrit language. He has combined those analogies in a very artificial manner; and has thus compressed a most copious etymology into a very narrow compass. His precepts are indeed numerous, but they have been framed with the utmost conciseness; and this great brevity is the result of very ingenious methods which have been contrived for this end, and for the purpose of assisting the student's memory. In Panini's system the mutual relation of all the parts marks that it must have been completed by its author; it certainly bears internal evidence of its having been accomplished by a single effort, and even the corrections, which are needed, cannot be interwoven with the text. It must not be hence inferred, that Panini was unaided by the labours of earlier grammarians; in many of his precepts he cites the authority of his predecessors, sometimes for a deviation from a general rule, often for a grammatical canon which has universal cogency. He has even employed some technical terms without defining them, because, as his commentators remark, those terms were already introduced by earlier grammarians. None of the more ancient works, however, seem to be now extant; being superseded by his, they have probably been diffused for ages, and are now perhaps totally lost.

The inaccuracies of the Paniniya grammar were corrected by Catyayana, an inspired saint and lawgiver, whose history is involved in the impenetrable darkness of mythology. The amended rules of grammar have been formed into memorial verses by Bhartri-hari, whose metrical aphorisms, entitled "Carica," have almost equal authority with the precepts of Panini, and emendations of Catyayana. Bhartri-hari is said to have lived in the century preceding the Christian era. The text of Panini being concise and ambiguous, many commentaries were composed to elucidate it, of the chief of which Mr. Colebrooke has given an account. The best and most concise commentary now extant, is entitled the "Carica vritti," or commentary composed at Varanasi. Within a few centuries past, a grammar, well adapted for aiding the student in acquiring a critical knowledge of the Shanscrit tongue, has been compiled by Ramachandra, entitled "Pracriyacaumudi."

When Shanscrit was the language of Indian courts, and was cultivated not only by persons who devoted themselves

to religion and literature, but also by princes, lawyers, soldiers, physicians, and scribes; in short, by the first three tribes, and by many classes included in the fourth; an easy and popular grammar must have been needed by persons who could not waste the best years of their lives in the study of words. Such grammars must always have been in use; those, however, which are now studied are not, we believe, of very ancient date. The most esteemed is the "Sarawata," together with its commentary named "Chandrica." It seems to have been formed on one of the Caumudis, by translating Panini's rules into language that is intelligible, independently of the glosses, and without the necessity of adverting to a different context.

Another popular grammar, which is in high repute in Bengal, is entitled "Mugd'habod'ha," and is accompanied by a commentary. It is the work of Vopadeva, and proceeds upon a plan grounded on that of the Caumudis; but the author has not been content to translate the rules of Panini, and to adopt his technical terms. He has, on the contrary, invented new terms, and contrived new abbreviations. The same author likewise composed a metrical catalogue of verbs alphabetically arranged. It is named "Cavicalpadruma," and is intended as a substitute for the "D'hatupata."

The best and most esteemed vocabulary of the Shanscrit is the "Amera cosha," which, like most other Shanscrit dictionaries, is arranged in verse to aid the memory. Numerous commentaries have been written on this vocabulary; the chief object of which is to explain the derivations of the nouns, and to supply the principal deficiencies of the text. Shanscrit etymologists scarcely acknowledge a single primitive amongst the nouns. When unable to trace an etymology which may be consistent with the acceptance of the word, they are content to derive it according to grammatical rules from some root to which the word has no affinity in sense. At other times they adopt fanciful etymologies from Puranas or from Tantras. But in general the derivations are accurate and instructive.

Amera's dictionary does not contain more than ten thousand different words. Yet the Shanscrit language is very copious. The insertion of derivatives, that do not at all deviate from their regular and obvious import, has been very properly deemed superfluous. Compound epithets, and other compound terms, in which the Shanscrit language is peculiarly rich, are likewise omitted; excepting such as are especially appropriated, by a limited acceptance, either as titles of deities, or as names of plants, animals, &c. In fact, compound terms are formed at pleasure, according to the rules of grammar; and must generally be interpreted in strict conformity with those rules. Technical terms too are mostly excluded from general dictionaries, and consigned to separate nomenclatures. The "Ameracosh" then is less defective than might be inferred from the small number of words explained in it. Still, however, it needs a supplement. The remaining deficiencies of the Ameracosh are supplied by consulting other dictionaries and vocabularies, which are very numerous.

The Shanscrit language is very copious and nervous; but the style of the best authors wonderfully concise. It far exceeds the Greek and Arabic in the variety of its etymology, and, like them, has a prodigious number of derivatives from each primary root. The grammatical rules are also numerous and difficult, though there are not many anomalies. "The Shanscrit language," says sir William Jones, (Asiat. Ref. vol. i. p. 422.) "whatever be its antiquity, is of a wonderful structure, more perfect than the Greek, more copious than the Latin, and more exquisitely refined than either; yet bearing to both of them a stronger affinity, both

both in the roots of verbs, and in the forms of grammar, than could possibly have been produced by accident; so strong, indeed, that no philologist could examine them all three without believing them to have sprung from some common source, which, perhaps, no longer exists. There is a similar reason, though not quite so forcible, for supposing that both the Gothic and the Celtic, though blended with a very different idiom, had the same origin with the Shanscrit, and the old Persian might be added to the same family."

The fundamental part of the Shanscrit language is divided into three classes; viz. *dhāt*, or roots of verbs, *śabd*, or original nouns, and *evya*, or particles. The latter are always indeclinable, as in other nations; but the words comprehended in the two former classes must be prepared by certain additions and inflexions to fit them for a place in composition. Here the art of the grammarian interposes, as not a syllable, nor a letter, can be added or altered but by regimen, nor the most trifling variation of the sense in the minutest subdivision of declension or conjugation can be effected without the application of several rules; and all the different forms for every change of gender, number, case, person, tense, mood or degree, are methodically arranged for the assistance of the memory; resembling, though on an infinitely more extensive scale, the compilations of *propria quæ maribus* and *as in præsentî*.

In the Shanscrit language, the three distinctions of genders, viz. masculine, feminine, and neuter, are preserved in their common number and order. A Shanscrit noun, in its first formation from the general root, exists equally independent of case as of gender. It is neither nominative, nor genitive, nor accusative, nor is impressed with any of those modifications, which mark the relation and connection between the several members of a sentence. In this state it is called an *imperfect*, or *crude* noun. To make a nominative any noun, the termination must be changed, and a new form supplied. Thus we see that, in the Shanscrit at least, the nominative has an equal right with any other inflexion to be called a case. The Shanscrit has seven declensions of nouns, which are all used in the singular, dual, and plural number, and differently formed, as they terminate with a consonant, and with a long or short vowel; and also as they are of different genders. The seven changes of inflexion are exclusive of the vocative, and therefore the Shanscrit comprehends two more than even those of the Latin: they are as follow, viz. 1. The nominative, or *agent* in a sentence; 2. The passive case, or *subject* of the action; 3. The *causal* case, pointing out the cause *by* which a thing is done; or the instrument *with* which it is done; or the subject *in* or *by* which it is suffered; 4. The dative, with the sign *to* or *for*; 5. The ablative, implying the subject *from* whence any thing proceeds; 6. The *possessive* case, called by us the genitive; 7. The *locative* case, definitive of situation, and generally known by the sign *in*. The vocative is excluded from the number of cases, as no inflexion is employed in its formation.

The Shanscrit, the Arabic, the Greek, and the Latin verbs are furnished with a set of inflexions and terminations so comprehensive, and so complete, that by their form alone they can express all the different distinctions both of person and time. Three separate qualities are in them perfectly blended and united. Thus by their root, they denote a particular act; and by their inflexion, both point out the time when it takes place, and number of the agents. Every Shanscrit verb has a form equivalent to the middle voice of the Greek, used through all the tenses with a reflexive sense; and the former is even the most extensive of the two in its use and offices: for in Greek the reflexive idea can only be adopted intransitively, when the action of the verb descends to no extraneous subject; but in Shanscrit the

verb is both reciprocal and transitive at the same time. The verb substantive of the Shanscrit very nearly resembles those of the Greek and Latin; but perhaps it would not be suspected that all the verbs in *mi* are formed exactly upon the same principle with the Shanscrit conjugations, even in the minutest particulars. All the terms which serve to qualify, to distinguish, or to augment either *substance* or *action*, are called by the Shanscrit grammarians under a head, literally signifying *increase* or *addition*. According to this arrangement, a simple sentence consists of three numbers: the agent, the action, and the subject; which, in a grammatical sense, are reduced to two, viz. the noun (whether agent or subject) and the verb. All such words as tend to specify or to amplify the noun, are denominated by a term which signifies *adjectives* or *epithets*; and such as are applied to denote relation or connection, are called *connectives of nouns*, and by European grammarians, *prepositions*: those particles which in any manner affect the verb are denominated *attributes of verbs*.

The Shanscrit alphabet contains fifty letters; and it is one boast of the Bramins, that it exceeds all other alphabets in this respect. But when we consider that of their thirty-four consonants, nearly half are combined sounds, and that six of their vowels are merely the correspondent long ones to as many which are short, the advantage seems to be little more than imaginary. The Shanscrit character, used in Upper Hindoostan, is said to be the same original letter that was first delivered to the people by Brihma, and is called Diewnagur, or the language of angels; whereas the character used by the Bramins of Bengal is by no means so ancient, and is evidently a corruption of the former. In the four beids, or vedas, which constitute the original and sacred text of the great Hindoo creator and legislator Brihma, the length of the vowels is expressed by a musical note or sign placed over every word; and in reading the beids, these distinctions of tone and time must be nicely observed; so that they produce all the effect of a laboured recitative. It is remarkable, that the Jews in their synagogues chant the Pentateuch in the same kind of melody, and it is supposed that this usage has descended to them from the remotest ages. Some writers have erroneously asserted, that the four beids are in verse; whereas they are written in a kind of measured prose; and they are now scarcely intelligible to the most learned pundits or lawyers; they are also scarce, and difficult to be found. However, comments have been written upon them from the earliest periods; of which one of the most ancient and approved was composed by Biseht Mahamomè, or the Most Wise, a great writer and prophet, who is said to have lived in the futee jogue, or first age of the world. See Halhed's Preface to his translation of the Code of Gentoo Laws, printed in 1776.

Dr. Leyden, in his account of the languages and literature of the Indo-Chinese nations, (*Asiatic Researches*, vol. x.) has shewn, that the "Pali," as it is generally written, or "Bali" language, as it is commonly pronounced, occupies the same place among the Indo-Chinese nations, which Shanscrit holds among the Hindoos, or Arabic among the followers of Islam. Throughout the greater part of the maritime countries, which lie between India and China, it is the language of religion, law, literature, and science, and has had an extensive influence in modifying the vernacular language of those regions. La Loubere, on the authority of d'Herbelot, has stated that the ancient Persian language was termed Pahalevi (Pahlavi), and that the Persians do not distinguish in writing between Pahali and Bahali. P. Paulinus, however, applies this term Bali inaccurately to the square Bali character, instead

SHANSKRIT.

of the language. This language, notwithstanding its extensive use among so many nations, and the degree of cultivation which it has received from the different tribes by whom it is employed, has hitherto attracted little attention among Europeans. The Bali alphabet, according to Dr. Leyden, seems, in its origin, to be a derivative from the Deva-nagari, though it has not only acquired considerable difference of form, but has been also modified to a certain degree, in the power of the letters, by the monosyllabic pronunciation of the Indo-Chinese nations. The form of the Bali character varies essentially among the different nations by whom it is used.

The Bali is an ancient dialect of Shanscrit, which sometimes approaches very near the original. When allowance is made for the regular interchange of certain letters, the elision of harsh consonants, and the contraction of similar syllables, all the vocables which occur in its ancient books, seem to be purely Shanscrit. In Cheritas and later compositions, however, some words of the popular languages of the country sometimes insinuate themselves, in the same manner as Tamul, Telinga, and Canara vocables occasionally occur, in the later Shanscrit compositions of the Dekhin. The Bali, while it retains almost the whole extent of Shanscrit flexions, both in nouns and verbs, nevertheless employs this variety rather sparingly in composition, and affects the frequent introduction of the preterite participle, and the use of impersonal verbs. It also uses the cases of nouns in a more indeterminate manner than the Shanscrit, and often confounds the active, neuter, and passive tenses of verbs. Like other derivative dialects, it occasionally uses Shanscrit nouns and particles in an oblique sense; but notwithstanding all these circumstances, it approaches much nearer the pure Shanscrit, than any other dialect, and exhibits a close affinity to the Prakrit, and the Zend.

These three dialects, the Prakrit, the Bali, and the Zend, are probably the most ancient derivatives from the Shanscrit. The great mass of vocables in all the three, and even the forms of flexions, both in verbs and nouns, are derived from the Shanscrit, according to regular laws of elision, contraction, and permutation of letters. Sometimes, in pursuing these analogies, they nearly coincide, sometimes they differ considerably, sometimes one, and sometimes another of them approaches nearest to the original Shanscrit. Their connection with this parent language was perceived, and pointed out by sir W. Jones, and has also been alluded to by P. Paulinus, who derives his information, concerning the Bali, from Carpanius and Mantegatius. The fate of these three languages is also, in some degree, similar. The Prakrit is the language which contains the greater part of the sacred books of the Jainas; the Bali is equally revered among the followers of Budd'ha; while the Zend, or sacred language of ancient Iran, has long enjoyed a similar rank among the Parsis or worshippers of fire, and been the depositary of the sacred books of Zoroaster. It is perhaps, however, more accurate to consider all the three, rather as different dialects of the same derivative language, than as different languages; and conformably to this idea, the Bali itself may be reckoned a dialect of Prakrit. The term Prakrit, both in books, and in common use among the Bramins, is employed with some degree of latitude. Sometimes the term is confined to a particular dialect employed by the Jainas, as the language of religion and science, and appropriated to females, and respectable characters of an inferior class, in dramas. Sometimes it includes all the dialects derived immediately from the Shanscrit, whether denominated Prakrit, Magad'hi, Suraseni,

Paifachi, or Apabhransa; and sometimes it is even extended to the Desa-b'hasas, or popular tongues of India, as Mahrasht or Mahratta, Canara, Telinga, Udia and Bengali. According to the extended use of the term Prakrit, it may certainly include both Bali and Zend; and if more extensive research should justify the idea derived from an imperfect investigation, Dr. Leyden apprehends that the Bali may be identified with the Magad'hi, and the Zend with the Suraseni, of Shanscrit authors.

These three dialects, the Prakrit, Bali, and Zend, have been regularly cultivated and fixed by composition. The same laws of derivation are applicable to the formation of all the three; but yet there is often considerable diversity in the forms which particular words assume, as appears from the comparative specimen given by Dr. Leyden.

The learned Mr. Colebrooke has published in the 10th volume of the Asiatic Researches, an elaborate essay on Shanscrit and Prakrit poetry. He observes, that the prosody of Shanscrit will be found, from the examples which he has adduced, to be richer than that of any other known language, in variations of metre, regulated either by quantity or by number of syllables, both with and without rhyme, and subject to laws imposing in some instances rigid restrictions, in others allowing ample latitude. The rules relative to Prakrit prosody, are applicable, for the most part, to Shanscrit prosody also; since the laws of versification in both languages are nearly the same.

Shanscrit prosody admits of two sorts of metre; one governed by the number of syllables; and which is mostly uniform or monoschematic in profane poetry, but altogether arbitrary in various metrical passages of the Vedas. The other is in fact measured by feet, like the hexameters of the Greek and Latin; but only one sort of this metre, which is denominated *Arya*, is acknowledged to be so regulated; while another sort is governed by the number of syllabic instants or *matras*.

The most common Shanscrit metre is the stanza of four verses, containing eight syllables each; and denominated from the name of the class "Anushtubh," for an account of which, and of other kinds of metres, we refer *ubi supra*.

The Shanscrit writers notice different species of prose. They discriminate three and even four sorts, under distinct names. 1. Simple prose, admitting no compound terms. It is denominated "Muktaca." This is little used in polished compositions; unless in the familiar dialogue of dramas. It must undoubtedly have been the colloquial style, at the period when Shanscrit was a spoken language. 2. Prose, in which compound terms are sparingly admitted. It is called "Culaca." This and the preceding sort are by some considered as varieties of a single species named Churnica. It is of course a common style of composition: and, when polished, is the most elegant as it is the chastest. But it does not command the admiration of Hindoo readers. 3. Prose abounding in compound words. It bears the appellation of "Utalica praya." Examples of it exhibit compounds of the most inordinate length: and a single word exceeding a hundred syllables is not unprecedented. This extravagant stile of composition, being suitable to the taste of the Indian learned, is common in the most elaborate works of their favourite authors. 4. Prose modulated so as frequently to exhibit portions of verse. It is named "Vrittigand'hi." It will occur without study, and even against design, in elevated compositions; and may be expected in the works of the best writers.

Some of the most elegant and highly wrought works in prose are reckoned among poems, as already intimated, in like

like manner as the "Telemache" of Fenelon and "Tod Abels" of Gesner. The most celebrated are the "Vafavaddatta" of Suband'hu, the "Dafa Cumara" of Dandi, and the "Cadambari" of Vana.

For a further account of the Shanscrit, see *Language of BENGAL*, or *BENGALESE*.

Exclusive of the Shanscrit, there are three different dialects in the kingdom of Bengal, viz. the Persian, the Hindoostanic, and the proper Bengalese. See *PERSIA* and *PERSIAN Language*, *HINDOOSTANEE*, and *BENGALESE*.

SHAN-SI, in *Geography*. See *CHAN-SI*.

SHAONA, a town of Egypt, on the W. coast of the Red sea; 90 miles S.S.E. of Cosseir.

SHAOSUMRE, a town of Arabia, in the province of Hedsjas; 25 miles from Calaat el Moilah.

SHAOUN, a town of Arabia, in the province of Hedsjas; 45 miles S. of Jambo.

SHAPARY, a town of Hindoostan, in the circar of Gangpour; 30 miles S.W. of Pada.

SHAPE, *Inflammation of, among neat cattle*, an affection in cows, arising in hot weather after taking the bull; and which is shewn by a swelling of the parts with boils or eruptions. It is observable by the animal rubbing her hind parts in the hedges, &c. In the cure Mr. Downing advises, after free bleeding, the following: Nitre in powder, two ounces; cream of tartar, three ounces; Castile soap, one ounce; and aniseed powder, one ounce; which are to be mixed for a dose, and to be given in a quart of warm whey, repeating them as there may be occasion.

To **SHAPE the Course**, in *Sea Language*, is to direct or appoint the track of a ship, in order to prosecute a voyage.

SHAPINSAY, in *Geography*, one of the Orkney islands, Scotland, is situated to the N. of the Mainland of Orkney, at the distance of three miles from Kirkwall, the capital of all the islands. It measures about seven miles in length and five in breadth, and formerly constituted part of the temporalities of the bishopric of Orkney. Almost the whole of it is capable of cultivation; but a great part yet remains in a neglected state, to the detriment, as well as the disgrace of the proprietors. Nevertheless, sufficient grain is raised for the supply of the inhabitants. Kelp is produced in great abundance, and is much used as a manure. Lead ore is likewise abundant in the south-west corner of this island, and was for some time wrought, but the work is now entirely abandoned.

In common with most of the Orkney islands, Shapinsay exhibits some monuments of antiquity: among these may be reckoned, besides several Popish chapels, a numerous collection of Picts-houses ranged along the shores, like so many forts, together with tumuli, or barrows, in various situations. A monumental stone of large dimensions raises its venerable head in a plain near its eastern extremity; and on the northern shore is the stone Odin.

To the south of Shapinsay, at the distance of a furlong, is situated the beautiful islet of Elgar or Ellerholm, which bears evident traces of former habitation, and of having been, at no very distant period, attached to the principal island. At present it furnishes pasture for a number of sheep and young cattle during summer, and serves to give, by its favourable position, the utmost security to the harbour of Elwick, which is one of the finest in the Orkneys. Barry's History of the Orkney Islands, 2d edit. by J. Headrick, Lond. 4to. 1808.

SHAPLEIGH, a post-town of America, in Massachusetts, in the province of Maine, incorporated in 1785; 108 miles N. of Boston.

SHAPOOTA HILLS, a mountainous ridge of Hindoostan, between the Nerbuddah and Taptee; 60 miles E. of Surat.

SHAPORA, a town of Hindoostan, in the circar of Rantampour; 45 miles W. of Rantampour.

SHAPOUR, a city of Persia, in the province of Farfistan, is said to have been originally founded by Taimuras Devedund, who called it Deen Dar; it was destroyed by Alexander the Great, and subsequently built by Sapor, the son of Artaxerxes Babegan, who named it after himself. The ruins of this ancient city are distant about 16 miles from Kazeroon: and if we may form an idea from the breadth and circumference of the ramparts, and the remains of some other public buildings, it must have been a city of great extent and magnificence. It is situated immediately under the eastern range of mountains, on the banks of a small but rapid river, and in a wild, romantic spot, amidst rocks and precipices, many of which are decorated with pieces of sculpture similar to those near Persepolis, for a description of which we refer to Kinneir's Memoir of the Persian Empire, p. 66. The hills in the immediate vicinity of these ruins appear to have been formerly fortified; and an extraordinary cavern, further up the river, has given rise to many fabulous stories.

SHAPS, an island in the Chesapeake; 27 miles S.S.E. of Annapolis. N. lat. 38° 46'. W. long. 76° 25'.

SHAR, or **SHEAR-Hog**, in *Agriculture*, a term signifying a yearling sheep, which has been once shorn. The same as lamb-hog. See *SHEEP*.

SHARAF BENI GATEI, in *Geography*, a town of Arabia, in the province of Hedsjas; 25 miles N. of Madian.

SHARBASHI, a town of Turkish Armenia; 18 miles S.E. of Moufh.

SHARBIN, a town of Egypt; 16 miles S.S.W. of Damietta.

SHARD, in *Agriculture*, a term applied to a fragment of an earthen vessel, or the gap in a hedge.

SHARE of a Plough, that part which enters, cuts, and breaks up the ground, the extremity forward being formed with a sharp-pointed iron, called the point of the share; and the end towards the wood behind, the tail of the share. This part constitutes a portion of what is usually denominated the *throat*, which is of very great importance in the construction of this implement. (See *PLOUGH*.) The dimensions are these: the length of the whole share from point to tail, according to Tull, should be three feet nine inches, but in modern ploughs much shorter; at the top of the iron it hath sometimes an upright piece called the fin; and near the iron, at the other end, there is an oblong-squared hollow called the socket; the use of which is to receive the bottom of the sheat. Near the tail there is a thin plate of iron, well rivetted to the wood; by means of this plate, the tail of the share is held firmly to the hinder sheat of the plough by a small iron-pin, with a screw at the end, and a nut screwed on it, on the inner or right side of the sheat. But shares are made in different forms.

The point of the share is that part in which it does not run up to the fin; this point is generally made three inches and a half in length, and should be flat underneath, and round at the top, and the lower part of it must be of hard steel. The edge of the fin should also be well steeled, and should make an acute angle with the share. The socket is a sort of mortise: it should be a foot long and about two inches deep: the fore-end of it must not be perpendicular, but oblique, conformable to the end of the sheat which enters into it. The upper edge of the fore-part must be always

always made to bear up against the sheat; but if this end of the socket should not be quite so oblique as the sheat, it may be helped by paring off a small part of the wood at the point.

However, in modern ploughs, the shares, as has been seen, are very different, according to their constructions and the uses for which they are intended.

Lately, improved cast-iron plough-shares have been made by R. Ransome, of Ipswich, Suffolk, for which he has obtained a patent. These shares are made hard on one side and soft on the other, which affords the great advantage of wearing thin, as it is found by farmers that those made in the common way wear thick, with a basil on the under side, which obstructs their entering into hard or strong soils, and at the same time increase the labour of the team, as well as pass over weeds without cutting or eradicating them. The same person also makes *plough-grounds*, which are so contrived, as that by turning a screw the plough is made to work more or less to the land with the greatest ease and facility. And both these contrivances are said to be capable of being applied to all sorts of ploughs which have been already constructed, and are in use upon farms.

The *broad share*, which is used in Suffex, is said to be a capital contrivance, whether invented in that district or in Kent. Its great use is in cutting over pea and bean stubbles, or such weedy fallows as do not require ploughing. It consists of an oblong share two feet long, and four or five inches wide, fixed to the stock or front of the ground rift, by an iron shank in the middle, and occasionally bolted to the side of the same rift of a wheel-plough. It is pitched with an inclination into the ground, capable of being raised or sunk at pleasure, by the elevation or depression of the beam on the gallows, answering the purpose of the great skim of the isle of Thanet, described in Young's Eastern Tour. When the stubbles have been cut over with this tool, they are harrowed, raked, and burnt, the land being left in excellent order for wheat.

On cast-iron plough-shares a very simple and beneficial improvement has lately been made by a person of the name of Morland, in Berkshire. It is well known that when the point, or sock, of wrought-iron plough-shares wears out, they are capable of being renewed; but that, in cast-iron, the case is otherwise. By this invention and improvement, however, which is much approved of in the above county, the blunt point is capable of being dipped or depressed in such a manner as to produce every effect which is wanted by the ploughman, when the share must have become quite useless without it. The cheapness and durability of cast-iron plough-shares render them highly desirable in all farming concerns where there is much ploughing to be done.

The whole is accomplished by the share having a sort of joint, and the top part taking in and out, and by a tuck that goes through the beam of the plough, which raises or falls the point of the share.

SHARE-Graft, provincially a sort of sedge.

SHAREMAN'S CREEK, in *Geography*, a river of Pennsylvania, which runs into the Susquehanna, N. lat. 40° 20'. W. long. 77° 5'.

SHARK, in the Linnæan system of *Ichthyology*, is a species of the *squalus*. Pennant makes it a distinct genus, the characters of which are these; the body is slender, and grows less towards the tail; it has two fins on the back; a rough skin; five apertures on the sides of the neck; the mouth generally placed far beneath the end of the nose; and the upper part of the tail longer than the lower. We know two different fish under the same name of shark, with the addition of their colour, blue and white.

The blue shark is that species of *squalus* called *glaucus*, and *galeus glaucus*, by authors, and distinguished by Artedi by the name of the *squalus* with a triangular dent, or furrow, in the extremity of the back, and with no foramina about the eyes. It is of a fine deep blue colour on the back, and of a bright silver white on the belly; the skin is smoother than that of the white shark, and the nose long pointed, and somewhat flattened, and extending far beyond the mouth; the nostrils are long, and placed transversely; the tail is bifid, and one portion of it is much larger than the other; it is very voracious of human flesh, and will follow close under the shore if there be depth enough, and a man is walking there. It is sometimes found on the English shores, and has been caught on the Cornwall coast, during the pilchard season, with large iron hooks, made on purpose. Ælian informs us, that this fish will permit the small brood, when in danger, to swim down its throat, and take shelter in its belly; and the fact has been confirmed by Rondeletius. Mr. Pennant apprehends that this care of their young is not peculiar to this species, but common to the whole genus of shark.

The other is the *lamia*, or *canis carcharias* of authors, the *squalus carcharias* of Linnæus, commonly called by us simply *the shark*. This is distinguished by Artedi by the name of the *squalus* with a flat back, and with numerous teeth, serrated at the edges.

The white shark, or *lamia*, is a very dreadful and voracious fish, the largest of all the sharks. They have been seen of four thousand weight, with throats capable of swallowing a lusty man whole; nay, men have been found whole in them when opened. Some have, for this reason, imagined this, and not the whale, to have been the fish in whose belly the prophet Jonah lay. Swimmers very often perish by them; sometimes losing an arm or leg, and sometimes being bit quite asunder, and serving only for two morsels for this ravenous animal. Its teeth are very sharp and terrible; they are disposed in six rows, and are all triangular, and notched like a saw on their edges; these are, in the whole, a hundred and forty-four in number, and are placed in various directions; their number is not exactly determinate; these teeth, when the fish is in a state of repose, lie quite flat in the mouth, but when he seizes his prey, he has power of erecting them, by the help of a set of muscles that join them to the jaw; the mouth is placed far beneath; on which account these fishes, as well as the rest of the kind, are said to be obliged to turn on their backs to seize their prey; which is an observation as ancient as the days of Pliny: its back is short and broad, in comparison of the other fish of this kind, and its tail, which is of a semi-lunar form, composed of two fins of a cubit in length each. This fish has surprising strength in its tail, and can strike with great force; so that the sailors instantly cut it off with an ax, as soon as they draw one on board. The pectoral fins are very large, which enable it to swim with great swiftness; the colour of the whole body and fins is a light ash; its skin is rough, and its eyes large and round. It is found both in the ocean and in the Mediterranean, and is of all fish the most voracious of human flesh.

It has its name from the Greek *λαίμος*, a voracious feeder, or *glutton*. The fossil bodies, called *glossopetræ*, or serpents' tongues, and supposed to be real stones, are the teeth of this fish.

SHARK, Basking, Squalus maximus of Linnæus, the name given by Mr. Pennant to a fish which inhabits the northern seas, as high as the arctic circle, and which was taken for a species of whale, till he pointed out the branchial orifices in the sides, and the perpendicular site of the tail.

This species has been long known to the inhabitants of the south and west of Ireland and Scotland, and those of Caernarvonshire and Anglesea; they quit the bays of these Welsh counties about Michaelmas, and the frith of Clyde, and the Hebrides, about the latter end of July. They have nothing of the fierce and voracious nature of the shark kind, but are so tame as to suffer themselves to be stroked; lying motionless on the surface of the water, commonly on their bellies, but sometimes on their backs, as if to sun themselves; whence they are called basking sharks. Their food seems to consist entirely of sea-plants. Linnæus says they feed on medusæ. At certain times they are seen sporting on the waves, and leaping with great agility several feet out of the water; they swim deliberately, with the dorsal fins above water; their length is from three to twelve yards, and they are sometimes longer; their form is slender; the upper jaw much longer than the lower, and blunt at the end; the mouth placed beneath, and each jaw furnished with numbers of small teeth; those before being much bent, and those more remote in the jaws being conic, and sharp-pointed; on the sides of the neck there are five large transverse apertures to the gills; on the back two fins; the first very large, nearer the head than the middle; the other small, and situated near the tail; on the lower part there are five others; viz. two pectoral fins, two ventral fins, and a small anal fin; near these, the male has two genitals, as in other sharks; and between these fins was situated the pudendum of the female; the tail very large, having the upper part much longer than the lower; the colour of the upper part of the body a deep leaden, and the belly white; the skin rough, like shagreen, but less so on the belly than on the back; within the mouth, towards the throat, was a very short sort of whalebone; the liver is of a great size, that of the female being the largest, and is melted into a pure and sweet oil, fit for lamps, and much used by the people, who take it to cure bruises, burns, and rheumatic complaints. A large fish will yield eight barrels of oil. These fishes are viviparous, a young one, a foot in length, having been found in the belly of one of them. When they are struck with a harpoon, and wounded, they sling up their tails, and plunge headlong to the bottom, coiling the rope round them, and attempting to disengage themselves from the harpoon, by rolling on the ground. They swim away with such rapidity and violence, that there has been an instance of a vessel of seventy tons having been towed away against a fresh gale; and they will employ the fishers for twelve, and sometimes twenty-four hours, before they are subdued. Pennant's British Zoology, vol. iii. p. 101, &c.

SHARK, *Hammer-headed*, *Squalus zyæna*, a fish of the shark kind, called also the *balance-fish*.

It is an extremely singular and remarkable fish, and differs not only from all the other sharks, but from all the fish in the world, in the figure of its head: this is not placed, as in all other fishes, longitudinally, or in a line with the body, but is set on transversely, as the head of a hammer or mallet upon the handle. This is semicircular at the front, and runs to so thin and sharp an edge, that as the fish swims forward with violence, it may cut other fishes, and is terminated at each end by an eye; these are very large, and so placed, that they more conveniently look down than either upward or sideway. In the farther part of the forehead also, near the eyes, on each side, there is a large oblong foramen, serving either for hearing or smelling, or perhaps for both; the mouth is very large, and placed under the head, and armed with four rows of extremely sharp and strong teeth, flat, and ferrated at their edges; the tail is composed of

two fins, one vastly larger than the other; the body is rounded and very long, and is not covered with scales, but a thick skin; the back is ash-coloured, and the belly white. Rondelet. de Aquat. p. 549.

It is caught in the Mediterranean, and sometimes in different parts of the ocean. Some authors have called it *zyæna*, and others *libella*; which last answers to the English name of the *balance-fish*.

SHARK, *Picked*. See ACANTHIAS and SQUALUS.

SHARK, *Long-tailed*. See Sea-Fox and SQUALUS *Vulpes*.

SHARK, *Spotted*, *Squalus Canicula* of Linnæus. See SQUALUS *Catulus*.

SHARK, *Lesser spotted*, called the *morgay*, or *rough bound-fish*, *Squalus Catulus* of Linnæus. See SQUALUS *Catulus*.

SHARK, *Smooth*, *Squalus Mustelus* of Linnæus. See SQUALUS *Mustelus*.

SHARK, called the *tope*, *Squalus Galeus* of Linnæus. See SQUALUS *Galeus*.

SHARK, called the *angel* or *monk-fish*, *Squalus Squatina* of Linnæus. See SQUALUS *Squatina*.

SHARK *River*, in *Geography*, a river of New Jersey, which runs into the Atlantic, N. lat. 40° 10'. W. long. 74° 4'.

SHARKIND, a town of Sweden, in East Gothland; 9 miles S.S.W. of Nordkiöping.

SHARKSTOWN, a town of Maryland, on the island of Kent; 28 miles S.E. of Baltimore.

SHARM *el Kiman*, or *Sharm el Kaman*, a port on the Red sea, on the coast of Egypt. N. lat. 24° 44'.

SHARMA, a town of Arabia, in the province of Hadramaut; 30 miles E.N.E. of Sahar.

SHARMAGOL, a town of Persia, in the province of Chorasán; 12 miles S. of Nefa.

SHARMAK, a sea-port of Africa, on the Gold Coast; 13 miles W. of Commendo.

SHARMALIK, a town of Asiatic Turkey, in the province of Diarbekir; 15 miles S.W. of Ourfa.

SHAROKIE. See SCHON.

SHARON, a town of the province of Maine; 40 miles N. of Portland.—Also, a town of Connecticut; 12 miles N.W. of Litchfield.—Also, a post-town of the state of New York; 25 miles W. of Albany.—Also, a township of Massachusetts; 10 miles S.W. of Boston.—Also, a township of Vermont, on White river; 6 miles N.W. of Norwich.

SHARP, ABRAHAM, in *Biography*, an eminent mathematician, mechanist, and astronomer, was descended from a family of Little Horton, near Bradford, in Yorkshire, where he was born about 1651. After he had received a good education, he was put apprentice at Manchester, but being steadily attached to mathematical pursuits, he quitted business and removed to Liverpool. Here he applied with great diligence to his favourite study, and to procure a subsistence he opened a school, where he taught writing and the elements of arithmetic. He next went to London, with the view of associating with Mr. Flamsteed, by whose interest he obtained a profitable employment in the dock-yard at Chatham, where he remained till he was invited to become the assistant of Flamsteed at the Royal Observatory at Greenwich. In this situation he continued to make observations, and had a large share in forming a catalogue of 3000 fixed stars, with their longitudes and magnitudes; their right ascension and polar distance, and the variations of the same, while they change their longitude by one degree. In this employment he injured his health, and was obliged to retire

to his native air, at Horton, where he fitted up an observatory of his own, having constructed a very curious machine for turning all kinds of work in wood and brass. He constructed most of the tools used by joiners, clock-makers, opticians, and mathematical instrument-makers. He manufactured entirely his own telescopes and other astronomical instruments.

He next materially assisted Mr. Flamsteed in calculating most of the tables in the second volume of his "*Hilitoria Celestis*," and made curious drawings of the constellations, which were sent to Amsterdam to be engraved, and though executed by a masterly hand, the originals were said to have exceeded the engravings in beauty and accuracy. In 1689 Mr. Flamsteed completed his mural arc at Greenwich, in which he had been greatly assisted by his friend Mr. Sharp, who had been some time in the observatory as his amanuensis. Mr. Smeaton, in a paper published in the *Philosophical Transactions* for the year 1786, speaking of this mural arc, says, it may be considered as the first good instrument of the kind, and that Mr. Sharp was the first person who cut accurate and delicate divisions upon astronomical instruments.

In 1717, Mr. Sharp published a work entitled "*Geometry Improved*," in which he engraved the figures as well as composed the work. This treatise contains 1. A large and accurate table of segments of circles, with the method of its construction, and various uses in the solution of difficult problems. 2. A concise treatise of polyhedra, or solid bodies of many bases, both the regular and irregular ones, to which are added twelve new ones, with various methods of forming them, and their exact dimensions in words or species, and also in numbers. In the year 1699 he undertook, for his own private amusement, the quadrature of the circle, deduced from two different series, by which the truth of it was demonstrated to 72 places of figures. Mr. Sharp maintained an epistolary correspondence with the most eminent mathematicians and astronomers of the day; among these were the illustrious Newton, Dr. Halley, and Dr. Wallis. It appears from a great variety of letters which remained after his death, written to him by these celebrated men, that he spared neither pains nor time to promote the interests of real science. Being justly reckoned one of the ablest calculators of his time, his assistance was required by, and freely given to Flamsteed, sir Josias Moore, Dr. Halley, and others, in all difficult calculations. When he quitted Mr. Flamsteed, he retired to Little Horton, in Yorkshire, where he spent the remainder of his days, and where he died in July 1742, in the 91st year of his age. He was of very retired habits, and admitted few visitors, excepting two gentlemen, at Bradford, one a mathematician and the other an ingenious apothecary. Many of his singularities are recorded in the *General Biography*, and also in *Hutton's Mathematical Dictionary*, to which the reader is referred.

SHARP, JOHN, archbishop of York, a celebrated divine of the church of England, was the son of a respectable tradesman at Bradford, in Yorkshire, where he was born in 1644. He was admitted of Christ's college, Cambridge, in 1660, and in 1667 he commenced master of arts, and was ordained. He was now appointed private tutor to the four sons of sir Heneage Finch, a station which he occupied about five years, when he obtained, through his patron's recommendation, the archdeaconry of Berkshire. When sir Heneage was raised to the post of keeper of the great seal, he manifested such confidence in the fidelity and judgment of his friend, as to commit to him the scrutiny of the characters of applicants for church livings in the gift of the crown. A sermon which he preached in 1674, re-

flecting upon those who dissented from the church, gave rise to a controversy, in which Dodwell, Baxter, and others engaged. In 1677 he was instituted to the rectory of St. Giles-in-the-Fields, in which parish he resided ten years. Among his parishioners was Richard Baxter, who, though he was himself a preacher on Sunday evenings, was a constant hearer of the rector in the mornings; and these two excellent men, notwithstanding their differences in some points, lived together upon the most friendly terms. In 1679 Mr. Sharp commenced D.D., and in 1681 he was promoted to the deanery of Norwich. On the death of Charles II., to whom he had been a chaplain, he drew up the address of the grand-jury of London to his successor, to whom he was also nominally chaplain. After this he preached against popery, and thus exciting the royal displeasure, he was obliged to quit the metropolis, and reside altogether at his deanery. He employed himself in forming a cabinet of coins, chiefly British, Saxon, and English. Being wearied with his exclusion from his function in London, he presented a very humble petition to the king, in consequence of which, he was allowed to return to his duty in the metropolis, and he was extremely careful never after to give offence, as he had done before. After the abdication of the monarch, Dr. Sharp irritated the adherents to William, by some offensive passages in a prayer and sermon, which he delivered before the house of commons, who at first refused him their accustomed thanks, which, however, were voted afterwards. In 1689, Dr. Sharp was appointed the successor to Dr. Tillotson in the deanery of Canterbury, and he was nominated one of the commissioners for revising the liturgy. At this period several bishops had been deprived of their fees for refusing to take the oaths to William and Mary, and Dr. Sharp might have succeeded to almost any of them, but he refused, not through any scruple of conscience, but on account of his friendship for the persons deprived. When, however, the archbishopric of York became vacant in a different way, he readily accepted the high office, and he was consecrated in July 1691. He filled this exalted station in a manner, which has caused him to be represented as a model of prelatical virtues, and which procured him general respect and esteem. He died at Bath in 1714, in the 69th year of his age. His only writings were sermons, of which were published two volumes, consisting of such occasional discourses as he had printed during his life-time, and five others, that were selected after his decease. He was reckoned an excellent preacher, and his style and doctrine are said to be equally of the standard purity. *Biog. Brit.*

SHARP, THOMAS, younger son of the preceding, was born in Yorkshire, and admitted of Trinity college, Cambridge, about 1703, when he was of the age of 15. He obtained a fellowship in 1729, and took his doctor's degree the same year. Archbishop Dawes appointed him his chaplain, and in 1720 he was collated to the rectory of Rothbury, in Northumberland. He was afterwards preferred to a prebend in Durham cathedral, and also to the archdeaconry of Northumberland. He died in 1758. Dr. Sharp wrote two dissertations concerning the etymology of the Hebrew words *Elohim* and *Berith*—"Discourses on the Antiquity of the Hebrew Tongue and Character." He left a son, Granville, to whose fine character as a genuine English patriot, we shall endeavour to do justice in the next article.

SHARP, GRANVILLE, son of the preceding, a most distinguished philanthropist and friend to the liberties of mankind, was born in the year 1734. He was educated for

the bar, but did not practise at it. When he quitted the legal profession, he obtained a place in the ordnance office, which he resigned at the commencement of the American war; the principles of which were abhorrent from his mind. He now took chambers in the Temple, and devoted himself to a life of study; at the same time, laying himself out for public utility. He first became known to the public in the case of a poor and friendless Negro, of the name of Somerset. This person had been brought from the West Indies to England by a master, whose name we should gladly hand down to the execration of posterity, if it were in our power; and falling into bad health, was abandoned by him as a useless article of property, and turned into the streets, either to die, or to gain a miserable support by precarious charity. In this destitute state, almost, it is said, on the point of expiring on the pavement of one of the public streets of London, Mr. Sharp chanced to see him. He instantly had him removed to St. Bartholomew's hospital, attended personally to his wants, and in a short time had the happiness to see him restored to health. Mr. Sharp now clothed him, and procured him comfortable employment in the service of a lady. Two years had elapsed, and the circumstance almost, and the name of the poor Negro, had escaped the memory of his benefactor, when Mr. Sharp received a letter from a person, signing himself Somerset, confined in the Poultry Compter, stating no cause for his commitment, but intreating his interference to save him from a greater calamity even than the death from which he had before rescued him. Mr. Sharp instantly went to the prison, and found the Negro, who in sickness and misery had been discarded by his master, sent to prison as a runaway slave. The excellent patriot went immediately to the lord mayor, William Nash, esq., who caused the parties to be brought before him; when, after a long hearing, the upright magistrate decided that the master had no property in the person of the Negro, in this country, and gave the Negro his liberty. The master instantly collared him, in the presence of Mr. Sharp and the lord mayor, and insisted on his right to keep him as his property. Mr. Sharp now claimed the protection of the English law, caused the master to be taken into custody, and exhibited articles of peace against him for an assault and battery. After various legal proceedings, supported by him with most undaunted spirit, the twelve judges unanimously concurred in an opinion that the master had acted criminally. Thus did Mr. Sharp emancipate for ever the race of blacks from a state of slavery, while on British ground, and in fact banished slavery from Great Britain. Such an incident could not fail deeply to impress a benevolent mind; and slavery, in every shape and country, became the object of his unceasing hostility. In 1769 he published a work, entitled "A Representation of the Injustice and dangerous Tendency of tolerating Slavery, or of admitting the least Claim of private Property in the Persons of Men in England." Having succeeded in the case of an individual Negro, he interested himself in the condition of the many others, who were seen wandering about the streets of London, and at his own expence collected a number of them, whom he sent back to Africa, where they formed a colony on the river Sierra Leone. He performed a still more essential service to humanity, by becoming the institutor of the "Society for the Abolition of the Slave Trade;" which, after contending against a vast mass of opposition, at length gloriously succeeded, as far as this country was concerned in the horrible traffic.

Mr. Granville Sharp is mentioned in connection with this business, in terms of the highest commendation, by Mr. Clarkson, in his "History of the Abolition of the Slave

Trade." (See vol. i. p. 63—70.) The following short account of him is extracted from the *Edinburgh Review*, vol. xii.

"We think it a duty to mention the name of Mr. Granville Sharp. Regardless of the dangers to which he exposed himself, both in his person and his fortune, Mr. Sharp stood forward in every case as the courageous friend of the poor Africans in England, in direct opposition to an opinion of York and Talbot, the attorney and solicitor-general for the time being. This opinion had been acted upon; and so high was its authority, that, after it had been made public, it was held as the settled law of the land, that a slave, neither by baptism, or arrival in Great Britain or Ireland, acquires freedom, but may be legally forced back to the plantations. Discouraged by judge Blackstone, and several other eminent lawyers, Mr. Sharp devoted three years of his life to the English law, that he might render himself the more effectual advocate of these friendless strangers. In his work, entitled "A Representation of the Injustice and dangerous Tendency of tolerating Slavery in England," published in the year 1769, and afterwards in his learned and laborious "Inquiry into the Principles of Villenages," he refuted the opinion of York and Talbot by unanswerable arguments, and neutralized their authority by the counter opinion of the great lord chief justice Holt, who many years before had decided, that as force could be used against no man in England without legal process, every slave coming into England became free, inasmuch as the laws of England recognized the distinction between person and property as perpetual and sacred. Finally, in the great case of Somerset, which was argued at three different sittings, in January, in February, and in May, of the year 1772, (the opinion of the judges having been taken up on the pleadings,) it is at last ascertained and declared to be the law of the land, that as soon as ever any slave set his foot upon English territory, he became free. Among the heroes and sages of British story, we can think of few whom we should feel a greater glow of honest pride in claiming as an ancestor, than the man to whom we owe our power of repeating with truth,

"Slaves cannot breathe in England; if their lungs
Receive our air, that moment they are free:
They touch our country, and their shackles fall."

Similar principles led Mr. Sharp to use his endeavours to restrain the arbitrary practice of marine impressment; and a citizen of London having been carried off by a press-warrant, Mr. Sharp obtained a *habeas corpus* from the court of king's bench, to bring him back from a vessel at the Nore; and by his arguments obliged the court to liberate him. In his political principles he was always the ardent and zealous friend to liberty, and he neglected no opportunity to defend its principles, and assert the rights of the people. He was the warm advocate of "parliamentary reform," and published, in 1778, the second edition of an excellent little work, full of constitutional knowledge and sound reasoning, entitled "A Declaration of the People's natural Right to a Share in the Legislature, which is the fundamental Principle of the British Constitution of State." He was, in 1794, as zealously attached to the cause as he had been twenty years before; though, perhaps, he did not feel himself sufficiently active to engage in it as a partizan, when it was a subject of obloquy. He was not, however, an unconcerned spectator of the dreadful tyranny, which, but for the intervention of an honest English jury, would have overwhelmed the land. He sent, to one of the persons at that time confined in the Tower of London, a copy of the work

work referred to, with assurances of a readiness to do any thing in his power to stem the torrent setting in against the liberties of the country.

Mr. Sharp's plan of reform recommended to the public, was founded on the earliest principles and practices of the British constitution. He proposed to restore the ancient *tythings, hundreds, &c.*; and the whole body of the people were to form a national militia, each thousand to constitute a regiment, the alderman or magistrate to be the colonel; and each hundred to constitute a company, the constable of each for the time being to be their captain. So many of the thousands to be summoned once in every year, by their magistrate, as would have a right to vote in their respective hundreds, before the constable, in the choice of their part of the representative legislature. Mr. Sharp has shewn that the division of this kingdom into tythings and hundreds was instituted by the immortal Alfred; that such a division is consistent with the most perfect state of liberty that man is capable of enjoying, and yet fully competent to answer all the purposes of mutual defence, to secure the due execution of the laws, and maintain public peace.

Mr. Sharp was educated in the principles of the established church, and through life shewed a warm attachment to them. He always, even at the close of life, had a thorough dread of Popery, but was candid and liberal to Protestant dissenters of all parties. His zeal for the established religion of the country led him to recommend an episcopal church in America; and he introduced the first bishops from that country to the archbishop of Canterbury for consecration.

Mr. Sharp died in July 1813, and like Cato, though advanced to the age of 79, he pursued his studies with all the ardour of youth. He was an able linguist, deeply read in theology, and was well acquainted with the scriptures in the original tongues. He was pious and devout, without gloom, strictly moral and temperate, a great lover of music, and cheerful in conversation. His services to humanity were very distinguished, and few persons in private life have deserved a higher or more honourable commemoration.

As a writer, his pieces are very numerous. From these we learn that he was a believer in the doctrines as set forth in the articles of the church, as that of original sin, the existence and operations of the devil on the human mind, and of the Athanasian mystery of the Trinity. He also, from studying the book of Revelation, fully expected the commencement of the *Millenium*, or personal reign of Christ on earth, in the spring of 1811; but he lived long enough to see his error. He possessed a very extensive library, in which the theologian, lawyer, classical scholar, politician, antiquary, and orientalist, might find almost every thing of which they could stand in need; and his collection of bibles was esteemed the best in the kingdom.

The principal works of Mr. Sharp, besides those already mentioned, are "Remarks on several very important Prophecies;" "Remarks on the Uses of the definitive Article in the Greek of the New Testament, containing many new Proofs of the Divinity of Christ," &c. This occasioned "Six Letters" to be addressed to him, in vindication of his theory; and also "Six more Letters, &c." by Gregory Blunt, esq., which is a work of great talent, profound learning, and masterly wit. It has long since been out of print, and the author is probably known only to two or three persons; the designation Blunt being assumed to conceal the real name. Mr. Sharp's last work was entitled "Remarks on the 68th Psalm, addressed to the Consideration of the House of Israel." *Monthly Mag. Gentle-*

man's Mag. Edin. Rev. Clarkson's Hist. of the Abolition of the Slave Trade.

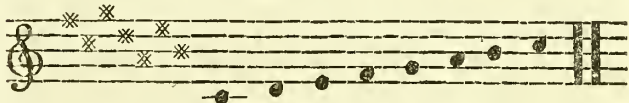
SHARP, SAMUEL, an able and distinguished surgeon in the middle of the last century, was a pupil of the celebrated Cheselden, and afterwards studied his profession with great zeal at the hospitals of Paris. He is said to have commenced his profession rather late in life; nevertheless, after settling in London, and obtaining an appointment as surgeon of Guy's hospital, his genius and assiduity soon obtained for him a high degree of celebrity, and extensive practice. He was elected a fellow of the Royal Society, and a foreign member of the Academy of Surgery at Paris; and he contributed to the improvement of his art by two valuable publications, which passed through many editions, and were translated into several foreign languages. The first of these was "A Treatise on the Operations of Surgery, with a Description and Representation of the Instruments; and an Introduction on the Nature and Treatment of Wounds, Abscesses, and Ulcers;" first printed in 1739. Our edition, printed in 1751, is the sixth. The second work was entitled "A critical Inquiry into the present State of Surgery;" first printed, we believe, in 1750. Our edition of 1761 is the fourth. See *Eloy Dict. Hist. de la Med.*, and Sharp's Works.

SHARP, in *Music*, is a chromatic sign, marked thus, ✱; and elevates the note before which it is placed half a tone, without changing its name or place on the staff.

A sharp on a line or space, at the beginning of a movement, affects all the notes of the same name throughout the piece, contradicted by a natural, ♮. See *NATURAL*.

An accidental sharp affects no note beyond the single bar in which it occurs; but it always, when accompanied by a base or lower part, implies a new modulation, except in minor keys, the sharp to the seventh of the key, which is a thing of course.

In the key of C ✱ with a sharp third, there are seven sharps at the clef, which implies that every note in the scale is elevated a semitone above its usual pitch.



In this key, an accidental sharp is marked by a double sharp ✱, usually called a *diess*, or enharmonic sharp; which see.

SHARP the *Bow-line*, in *Sea Language*. See *BOWLING*.

SHARP *Nails*. See *NAIL*.

SHARPE, GREGORY, in *Biography*, a learned divine, was born in Yorkshire in the year 1713. He received his education first at Westminster school, and afterwards at Aberdeen, under the learned Blackwell. Upon his entering orders he became minister of St. Margaret's chapel, Westminster; after this, he was appointed chaplain to the king, and master of the Temple. He was also elected a fellow of the Royal and Antiquarian Societies; and died in 1771. He united to great learning a taste for the fine arts, and etched several plates in the edition of Dr. Hyde's *Syntagma*. His own works are, 1. A Review of the Controversy about the Meaning of the Demoniacs in the New Testament. 2. A Defence of Dr. Clarke against Leibnitz. 3. Two Dissertations upon the Origin of Languages, and the Power of Letters; with a Hebrew Lexicon. 4. A Dissertation on the Origin and Structure of the Latin Language. 5. Two Arguments in Defence of Christianity. 6. Translation of Holberg's Introduction to Universal History. 7. Sermons.

To which is prefixed a biographical preface, from which the foregoing facts have been extracted.

SHARPING CORN, a customary present of corn, which, at every Christmas, the farmers in some parts of England make to their smith, for sharpening their ploughing-irons, harrow-tines, &c.

SHARPLING, in *Ichthyology*, the English name of the gasterosteus. See *STICKLE-Back*.

SHARPSBURG, in *Geography*, a town of America, in Maryland; 69 miles N.W. of Baltimore.

SHARUM, a town of Arabia, in Hadramaut; 15 miles S.W. of Keschim.

SHARUT, **SHAH RAT**, or *Sharoot*, a small town of Persia, in Aftabad, called also Bistan, is surrounded in some parts with a slight earthen wall. The houses, from a want of wood, are built of unburnt bricks, and covered with a flat arch of the same materials. In its vicinity are seen many people, whose noses, fingers, and toes have been destroyed by the frost, which is said to be severer at this place than in any part of Persia. This town, with its dependencies, yields a revenue of 1969 tomanas. The position of the town is determined by two routes, one from Tehraun and the other from Tarshih.

SHASAD, or **SHAZADBARY**, a town of Hindoostan, in the circar of Sumbul; 16 miles S. of Sumbul.

SHASAVA, a town of Hindoostan; 18 miles S. of Agra.

SHASH, AL. See *TASHKUND*.

SHASHTI, in *Mythology*, a name of the Hindoo goddess *Parvati*; which see.

SHASK, in *Geography*, a town of Hindoostan, in Baglana; 15 miles S. of Bahbelgong.

SHASSAIR, a town of Africa, in Biledulgerid; 7 miles N. of Fighig.

SHASTAH, **SHASTER**, or *Sastra*, which latter is said to be the correct spelling and pronunciation, the name of a sacred book, in high estimation among the idolaters of Hindoostan, containing all the dogmas of the religion of the Bramins, and all the ceremonies of their worship, and serving as a commentary on the Vedam.

The word is derived from a root signifying *to ordain*, and means generally an ordinance, and particularly a sacred ordinance delivered by inspiration: properly, therefore, the word is applicable chiefly to sacred literature.

The term Shaster denotes *science* or *system*; and is applied to other works of astronomy and philosophy, which have no relation to the religion of the Indians. None but the Bramins and rajahs of India are allowed to read the Vedam; the priests of the Banians, called *Shuderers*, may read the Shaster; and the people, in general, are allowed to read only the Paran or Pouran, which is a commentary on the Shaster.

The Shaster is divided into three parts; the first containing the moral law of the Indians; the second, the rites and ceremonies of their religion; and the third, the distribution of the people into tribes and classes, with the duties pertaining to each class.

The principal precepts of morality contained in the first part of the Shaster, are the following: that no animal be killed, because the Indians attribute souls to brute animals as well as to mankind; that they neither hear nor speak evil, nor drink wine, nor eat flesh, nor touch any thing that is unclean; that they observe the feasts, prayers, and washings, which their law prescribes; that they tell no lies, nor are guilty of deceit in trade; that they neither oppress nor offer violence to one another; that they celebrate the

solemn feasts and fasts, and appropriate certain hours of ordinary sleep to cultivate a disposition for prayer; and that they do not steal, or defraud one another.

The ceremonies contained in the second part of the Shaster, are such as these: that they wash often in the rivers, hereby obtaining the pardon of their sins; that they mark their forehead with red, in token of their relation to the Deity; that they present offerings and prayers under certain trees, set apart for this purpose; that they pray in the temple, make oblations to their pagodas, or idols, sing hymns, and make processions, &c.; that they practise pilgrimages to distant rivers, and especially to the Ganges, there to wash themselves, and make offerings; that they make vows to particular saints, according to their respective departments; that they render homage to the Deity, at the first sight of the sun; that they pay their respect to the sun and moon, which are the two eyes of the Deity; and that they treat with particular veneration, those animals that are deemed more pure than others, as the cow, buffalo, &c. because the souls of men have transmigrated into these animals.

The third part of the Shaster records the distribution of the people into four classes; the first being that of the Bramins, or priests, appointed to instruct the people: the second, that of the Kutteris, or nobles, who are the magistrates: the third, that of the Shudderis, or merchants: and the fourth, that of the mechanics. Each person is required to remain in the class in which he was born, and to pursue the occupation assigned to him by the Shaster. According to the Bramins, the Shaster was imparted by God himself to Brahma, and by him to the Bramins, who communicated the contents of it to the people.

Modern writers have given us very different accounts of the antiquity and importance of the Shaster. Mr. Holwell, who had made a considerable progress in the translation of this book, apprehends, that the mythology, as well as the cosmogony of the Egyptians, Greeks, and Romans, were borrowed from the doctrines of the Bramins contained in it, even to the copying of their exteriors of worship, and the distribution of their idols, though grossly mutilated and adulterated. With respect to the Vedam and Shastah, or scriptures of the Gentoos, this writer informs us that Vedam, in the Malabar language, signifies the same as Shastah in the Sanscrit; and that the first book is followed by the Gentoos of the Malabar and Coromandel coasts, and also of the island of Ceylon. The Shastah is followed by the Gentoos of the provinces of Bengal, and by all the Gentoos of the rest of India, commonly called India Proper, along the course of the rivers Ganges and Jumna to the Indus. Both these books, he says, contain the institutes of their respective religion and worship, as well as the history of their ancient rajahs and princes; often couched under allegory and fable: their antiquity is contended for by the partisans of each; but he thinks, that the similitude of their names, idols, and great part of their worship, leaves little room to doubt, nay, plainly evinces, that both these scriptures were originally one. He adds, if we compare the great purity and chaste manners of the Shastah, with the great absurdities and impurities of the Vedam, we need not hesitate to pronounce the latter a corruption of the former.

With regard to the high original of these scriptures, the account of the Bramins is chiefly as follows. Brahma, *g. d.* Mighty Spirit, about four thousand eight hundred and sixty-six years ago, assumed the form of man, and the government of Hindoostan. He translated the divine law (designed for the restoration of mankind, who had offended in a pre-existent state,

state, and who are now in the last scene of probation, to the dignity from which they were degraded,) out of the language of angels into the well-known Sanscrit language, and called his translation the "Chartah Bhade Shastah" of Birmah, or the Six Scriptures of the Divine Words of the Mighty Spirit. He appointed the Bramins, deriving their name from him, to preach the word of God; and the doctrines of the Shastah were accordingly preached in their original purity a thousand years. About this time there was published a paraphrase on the Chartah Bhade: and about five hundred years afterwards, a second exposition, called "Aughtorrah Bhade Shasta," or eighteen Books of Divine Words, written in a character compounded of the common Hindoo-tan and the Sanscrit. This innovation produced a schism among the Gentoos; on which occasion, it is said, those of Coromandel and Malabar formed a scripture of their own, which they pretended to be founded on the Chartah Bhade of Birmah, and called it the Vedam of Birmah, or Divine Words of the Mighty Spirit. The original Chartah Bhade was thrown aside, and, at length, wholly unknown, except to a few families, who can still read and expound it in the Sanscrit character. With the establishment of the Aughtorrah Bhade, and Vedam, which, according to the Gentoos account, is three thousand three hundred and sixty-six years ago, their polytheism commenced; and the principles of religion became so obscure, and their ceremonies so numerous, that every head of a family was obliged to keep a Bramin, as a guide both in faith and practice. Mr. Holwell is of opinion, that the Chartah Bhade, or original scriptures, are not copied from any other system of theology, promulgated to, or obtruded upon mankind. The Gentoos do not attribute them to Zoroaster; and Mr. Holwell supposes, that both Zoroaster and Pythagoras visited Hindoo-tan, not to instruct, but to be instructed.

From the account of Mr. Dow we learn, that the books which contain the religion and philosophy of the Hindoos, are distinguished by the name of Bedas; that they are four in number, and, like the sacred writings of other nations, said to be penned by the divinity. Beda, he says, in the Sanscrit language, literally signifies *science*; and these books treat not only of religion and moral duties, but of every branch of philosophic knowledge. The Bramins maintain, that the Bedas are the divine laws, which Brimha, at the creation of the world, delivered for the instruction of mankind; but they affirm, that their meaning was perverted in the first age by the ignorance and wickedness of some princes, whom they represent as evil spirits, who then haunted the earth. The first credible account we have of the Bedas is, that about the commencement of the calling, of which era the year 1768 was the 4886th year, they were written, or rather collected, by a great philosopher, and reputed prophet, called Beas Muni, or Beas the Inspired.

The Hindoos, says Mr. Dow, are divided into two great religious sects: the followers of the doctrine of Bedang, which is the original Shaster, or commentary upon the Bedas; and those who adhere to the principles of the Neadirsen. The original Shaster is called Bedang, and is a commentary upon the Bedas. This, he says, is erroneously called, in Europe, the Vedam. It is ascribed to Beas Muni, and said to have been revised some years after by one Serrider Swami, since which it has been reckoned sacred, and not subject to any farther alterations. Almost all the Hindoos of the Deccan, and those of the Malabar and Coromandel coasts, are of this sect. The followers of the Bedang Shaster do not allow that any physical evil exists; they maintain that God created all things perfectly good, but that man, being a free agent, may be guilty of moral evil,

which may be injurious to himself, but can be of no detriment to the general system of nature. God, they say, being perfectly benevolent, never punished the wicked otherwise than by the pain and affliction which are the natural consequences of evil actions; and hell, therefore, is no other than a consciousness of our evil.

The Neadirsen Shaster is said to have been written by a philosopher called Goutam, near four thousand years ago. The Bramins, from Mr. Dow's account of their sacred books, appear to believe invariably in the unity, eternity, omniscience, and omnipotence of God; and the polytheism, of which they have been accused, is no more than a symbolical worship of the divine attributes, which they divide into three classes. Under the name of Brimha, they worship the wisdom and creative power of God; under the appellation of Bisnen, his providential and preserving quality; and under that of Shibah, that attribute which tends to destroy.

According to M. de Sainte-Croix, the Shasta, however extolled in Europe with respect to its antiquity, is posterior to the Vedam, being no more than the explication of it. Holwell's Interesting Historical Events, &c. 8vo. Dow's History of Hindoo-tan, 4to. 1768. L'Ezour Vedam, &c. by M. de Sainte Croix, 12mo. Paris, 1779. See GENTOOS, SHANSCRIT, and VEDAM.

Six Sastras are commonly described as of superior sanctity, and are called the *proper* Sastras:—in these are comprised the four Vedas, the eighteen Puranas, commentaries on the Vedas, called Upaveda, and others. (See VEDA, and PURANA.) The Sudra, or lowest of the four classes of Hindoos, are not permitted to study these six Sastras, as being too holy for such prophane contemplation. (See SUDRA.) As noticed under the article RAMAYANA, that book is reckoned too sublime for the perusal of so inferior a class. The Sudra may *hear* it read. An ample field, however, remains for them in the study of prophane literature, comprised in a multitude of popular books, which correspond with the several Sastras, and abound with beauties of every kind. All the tracts on medicine must indeed be studied by the Vaidyas, or those who are born physicians; and this profession is confined chiefly to the Sudras. The Vaidyas are said to have often more learning than many Bramins, with far less pride than any. They are usually poets, grammarians, rhetoricians, &c. and may be esteemed in general among the most amiable and virtuous of the Hindoos. See VAIDYA.

The word Sastra is, however, applied more extensively than the above account may seem to imply. For instance, a collection of tracts on arts and manufactures, is called Silpi Sastra. The name of Niti Sastra is given to a system of ethics. The Dersana Sastra is indeed one of the six superior, and comprises an explanation of the principles of the six philosophical schools; a brief notice of which is given under the article PHILOSOPHY of the Hindoos. An analysis of this work would shew that many of its theories are either the source of similar doctrines propounded in later times in Greece, or borrowed from the same source with them. Other collections of tracts, and some separate works, bear also the denomination of Sastra; and it is sometimes rather vaguely applied. A Brahman deeply versed in sacred literature has the honourable title of Sastrî added to his name; equivalent to our *clericus*. Sometimes he is distinguished by it alone, and called *the Sastrî*. There is also the Dherma Sastra, a body of ethics and ritual observances; the Agama Sastra, or occult ordinances. This latter has been suspected to have some reference to the Ogham of the west. See OGHAM, and O'M.

Saſtri, which was omitted in its proper place, is a name for the Hindoo deity Budha, or Boodh. The name ſignifies wiſdom, or a wife man; and is ſtill applied to, or aſſumed by, individuals, eſpecially Bramins, who are ſuppoſed to have acquired an extraordinary degree of learning or wiſdom. As all profitable wiſdom is preſumed to be comprized in the *Saſtra*, or ſacred books, the title of *Saſtri* is thence derived. It is ſometimes appended ſimilarly to the ſcholar's name; and he is at others called the *Saſtri*, or *Saſtri ſahib*,—Mr. *Saſtri*.

SHASUMAN, in *Geography*, a town of Perſia, in the province of Mazanderan; 30 miles E. of Eſterabad.

SHAT-EL-AMAAR, a name given by the Arabs to the Tigris.

SHAT-EL-DEAAL, a river which runs from the north, and enters the Tigris near Bagdad.

SHAT-EL-DEGELA, a river or canal, ſo called by the Arabs, which communicates with another named *Shat-el-Hie*, which is a branch of the Tigris.

SHAT-EL-FRAATE, a name given by the Arabs to the Euphrates.

SHAT-KRATU, in *Mythology*, one of the names of the Hindoo Indra, regent of the firmament. It means the hundred ſacrifices; that is, he to whom a hundred ſacrifices are offered; or rather, perhaps, he who has offered them. Indra, it is fabled, obtained his preſent dignity by the great ſacrifice of a hundred horſes. An offering of a horſe is called *Aſwamedha*, and is attended with infinite trouble and expence, as laid down in the Hindoo rituals. See *INDRA*, *NARAMEDHA*, and *RHEMBA*.

SHATNUF, in *Geography*, a town of Egypt, on the right bank of the Nile; 9 miles N. of Cairo.

SHATOOR, a town of Hindooſtan, in Madura; 20 miles N.N.W. of Coilpetta.

SHATORE, a town of Hindooſtan, in Madura; 12 miles N.E. of Coilpetta.

SHAT-UL-ARAB, one of the nobleſt rivers in the Eaſt, formed by the combined ſtreams of the Euphrates and Tigris. The union of theſe ſtreams takes place near Korna, or Corny, which is one of the three Apameas, built by Seleucus in honour of his firſt wife, Apama. On the weſtern bank of this river, and 70 miles from its mouth, in N. lat. $31^{\circ} 30'$, is ſituated the city of Buſſora or Baſra; and the river is navigable as far as the city for ſhips of 500 tons burthen. The city is ſometimes fo completely deluged by the river, that it appears like an iſland in the middle of a lake. The combined ſtream of the *Shat-ul-Arab* has generally been thought to enter the Perſian gulf by a variety of mouths: but the fact is, that this noble river has, at this time, only one mouth, and probably never had any other. The iſland, or delta, between the *Shat-ul-Arab* and the *Bamifern* (the ancient *Mefena*) was formerly included in the pachalic of Bagdad; but having been conquered by Sheikh Solyman from the Turks, has remained in the poſſeſſion of his ſucceſſors. This is a low and fertile tract: the northern parts of which, towards the Haſur, are interſected by a number of canals, and are in a tolerable ſtate of cultivation. Extenſive ruins are viſible in many places, and the borders of the *Shat-ul-Arab*, as far down as Chubda, are covered with date-trees. The river "*Shat-el-Ajew*," ſignifying in Arabic a river of Perſia, diſcharges itſelf on the Perſian ſide into the *Shat-ul-Arab*, near Margill.

SHATZAM, a town of Perſia, in the province of Mekran; 210 miles S.E. of Arokhaſe.

SHAVAKAT, a town of Turkeſtan, on the Sirr; 20 miles S. of Taſhkund.

SHAUBACO, a town of Egypt, on the left bank of the Nile; 16 miles S. of Cairo.

SHAVE GRASS, in *Botany*. See *EQUISETUM*.

SHAVING-IRONS, among *Gardeners*, tools to keep a garden free from weeds, otherwiſe called *edging-irons*.

SHAVINGS, HORN, in *Agriculture*. See *MANURE*.

SHAUL, or SHAWL, an article of female dreſs, much prized in the Eaſt, and now well known in England. As the ſhaws all come from Caſhmere, or Cachemir, it was generally concluded, that the materials from which they were fabricated was of the growth of that country. It was ſaid to be the hair of a particular goat, and the fine under hair from a camel's breaſt; but we now certainly know that it is the produce of a Thibet ſheep. Bernier relates, that in his time, ſhaws made for the great omrahs of the Thibetian wool, coſt a hundred and fifty rupees; whereas thoſe made of the wool of the country never coſt more than fifty. For an account of their manufacture and value, ſee *CASHMERE*.

SHAVOYA, or CHAVOYA, in *Geography*, a province of the empire of Morocco, ſituated to the S. of the kingdom of Fez, and W. of Tedla; inhabited by mountaineers addicted to robbery and violence. Towards the latter end of the laſt century reſuſing to pay tribute to the emperor, Muley Iſhmael, he marched an army, which, ſurrounding their ſtrong holds on the mountains, compelled them to flight, leaving their wives and children, who were put to the ſword, and the plunder diſtributed among the ſoldiers.

SHAUR, a ſmall iſland in the Red ſea. N. lat. $27^{\circ} 20'$. E. long. $34^{\circ} 58'$.

SHAUS. See *CHAUS*.

SHAVUNGUNK, a mountain of New York; 20 miles S. of Kingſton.

SHAW, THOMAS, in *Biography*, was born at Kendal in or about the year 1692. He was educated at the grammar ſchool of that town, and in 1711 was admitted of Queen's college, Oxford. Soon after he had taken orders, he was appointed chaplain to the Engliſh faſtory at Algiers, in which ſtation he remained ſeveral years, making uſe of the opportunity which it afforded of travelling into various parts of Barbary, and into Egypt. In 1727 he was elected fellow of his college, in 1733 he commenced D.D., and in the following year he was elected a member of the Royal Society in London. In 1738 he published his "*Travels, or Obſervations on ſeveral Parts of Barbary and the Levant*," to which a ſupplement was added in 1746; and about ten years afterwards the whole appeared in a ſecond edition, with conſiderable improvements. Few books of the kind ſtand higher in reputation than Dr. Shaw's *Travels*, which contain many learned diſſertations reſpecting the countries which he had viſited, with divers remarks on their manners and cuſtoms, and valuable obſervations in natural hiſtory. They have been regarded as particularly uſeful in illuſtrating the ſcriptures by comparisons between the ancient and modern ſtate of the eaſtern regions. Dr. Shaw, on his return from his travels, brought back a large collection of dried plants. He preſented to the univerſity of Oxford ſome relics of antiquity which he had collected, of three of which engravings were made in the "*Marmora Oxoniensis*." In the year 1740 he was choſen principal of St. Edmund's Hall, and was at the ſame time preſented to the vicarage of Bramley in Hampſhire. Soon after the regius profeſſorſhip was conferred upon him, which he held till his death, in 1751. His *Travels* have been tranſlated into various modern languages. An attack was made on them by Dr. Pocock, which led the author to defend them in his ſupplement, and in a letter of Dr. Clayton, biſhop of Clogher.

SHAW,

SHAW, PETER, a physician, and contemporary of the former, was the author of several works, which enjoyed a considerable reputation in their day. His first publication was entitled "New Practice of Physic," in two volumes, and first printed in 1726: it contained a brief description of diseases and the methods of treating them. His next work was an "Enquiry into the Virtues of Scarborough Spaw Waters," which he visited during the season; it was printed in 1734. In the same year he published also "Chymical Lectures publicly read in London 1731, 1732, and Scarborough 1733." This was deemed a scientific and valuable work, and was translated into French. He published some minor works, "A Portable Laboratory," 1731; "On Scurvy," 1736; "Essays in Artificial Philosophy," 1731; "On the Juice of the Grape," 1724; and he edited the "Dispensatory of the College of Physicians of Edinburgh," in 1727. See Eloy Dict. Hist. de la Méd.: and the works mentioned.

SHAW, GEORGE, the younger of two sons of the reverend Timothy Shaw, was born December 16th, 1751, at Birtton, in Buckinghamshire, of which place his father was vicar. He shewed, at a very early age, a great propensity to study, and when he was only four years old, instead of following the amusements common to young children, he usually entertained himself with books, or by the side of ditches and rivulets catching insects, and taking them home, and would spend all his leisure time in watching their motions and examining their structure. He was educated entirely by his father, and before he was fourteen years of age, his proficiency was such as allowed him to enter with great advantage upon a course of college studies. In 1765 he was entered at Magdalen-hall, Oxford, where he was no less distinguished by the regularity of his conduct, than by an uncommon diligent application to his studies. In 1769 he was admitted to the degree of B.A. and in May 1772 to that of M.A. In order that he might assist his father in his clerical duties, he took orders, and was ordained deacon in 1774, at Buckden, by Dr. Green, bishop of Lincoln, and regularly performed the duty at Stoke and Buckland, two chapels, each three miles apart from the mother church. As soon as an opportunity offered, he laid aside his theological career, which was never quite congenial to his mind, and went to Edinburgh, to qualify himself for the profession of physic. Having attended the lectures of Black, Cullen, and other eminent professors for three years, he returned to Oxford, where he was appointed deputy botanical lecturer. In this office he acquired much celebrity. He had been appointed to his office by Dr. Sibthorp, the botanical professor, who was then upon the eve of setting out upon his travels into Greece. (See SIBTHORP.) Upon the death of this gentleman, Dr. Shaw became candidate for the vacant professorship, in which he would unquestionably have been successful, had not an old statute been found, which prohibits a person in orders from filling the office. In 1787 he was admitted to the degrees of bachelor and doctor of medicine: it appears that at this time he had removed from Magdalen-hall to Magdalen college. In the same year he removed to London, where he practised as a physician. Shortly after this, several gentlemen, distinguished for their attachment to the study of, and eminent for their acquirements in natural history, established a society for the advancement of this science, under the denomination of the Linnæan Society. Dr. (now Sir James) Smith was elevated to the presidency, and Dr. Shaw was nominated one of the vice-presidents. To the Transactions of this Society Dr. Shaw contributed the following papers. "Description of the *STYLEPHORUS Cordatus*," which see; "Description of the

CANCER *Stagnalis*;" "Remarks on the *SCOLOPENDRA Electrica* and *SCOLOPENDRA Subterranea*;" "A Note to Mr. Kirby's Description of the new Species of *Hirudo*;" "Account of a minute *Ichneumon*;" "Description of the Species of *Mycteria*;" "Description of the *Mus Burfarius*, and *Tubularia Magnifica*."

Dr. Shaw at this period delivered a course of lectures at the Leverian Museum, and never failed, as well before, as after, that rich and magnificent collection was removed from Leicester Fields, to attract very large and scientific audiences. In 1789 Dr. Shaw began to publish "The Naturalist's Miscellany," which came out in monthly numbers, and continued to his decease, when 286 parts had been published, and, according to the biography of the author given in the Gentleman's Magazine, a posthumous number, with an index, was to terminate the work, which is described as a most beautiful and extensive production, comprising, in 1064 plates, figures of the more curious and remarkable productions of the three kingdoms of nature, more particularly of the animal kingdom, with descriptions in Latin and English. In this year Dr. Shaw was elected a fellow of the Royal Society, and in 1790 he projected a work in 4to. entitled "Speculum Linnæum; or Linnæan Zoology," but it probably did not promise success, as a single number only appeared. In 1791 Dr. Shaw became a candidate for the office of a librarian in the British Museum, and his qualifications, which were of the first order, procured him the appointment of assistant keeper of the natural history. He now quitted the duties of physician, and devoted himself entirely to researches in natural science. Between the years 1792—6, appeared the following work; "Musæi Leveriani explicatio Anglica et Latina, opera et studio Georgii Shaw, M.D. F.R.S. Adduntur figuræ elegantur sculptæ et coloratæ. Impensis Jacobi Parkinson." In 1794 Dr. Shaw, in conjunction with Dr. Smith and Mr. Sowerby, engaged in a splendid publication, illustrative of the accessions which had been made to natural science on the shores of New Holland. The animals peculiar to that country were described by Dr. Shaw in a work entitled "The Zoology of New Holland;" the figures were delineated by Mr. Sowerby; and the botanical part was written by Dr. Smith, and published under the title of "The Botany of New Holland."

Sixty large plates published by Miller, the editor of the Gardener's Dictionary, under the title of "Various Subjects in Natural History, wherein are delineated Birds, Animals, and many curious Plants," being judged defective from want of letter-press, Dr. Shaw supplied the deficiency in a work entitled "Cimelia Physica: Figures of rare and curious Quadrupeds, Birds, &c. together with several most elegant Plants, engraved and coloured from the Subjects themselves: with Descriptions by George Shaw, M.D. F.R.S."

In the year 1800, Dr. Shaw began his great work, entitled "General Zoology, or Natural History, with Plates from the best Authorities, and most select Specimens." This work had proceeded to the eighth volume during the life-time of the author, and a ninth was left ready for the press. In this work he intended to comprise the whole of the history of the animal world. It began with quadrupeds, and had proceeded through fishes, amphibia, insects, and part of the birds. The Linnæan arrangement, with occasional variations, has been pursued throughout.

In the years 1806 and 1807, Dr. Shaw delivered a course of zoological lectures, which were published in 1809 in two large volumes 8vo. In the first nine lectures the author has compressed the substance of what he had delivered in the General Zoology, and in the three remaining lectures is

a sketch of what, had his life been spared, he intended to accomplish in completing the General Zoology. In 1807, upon the death of Dr. Gray, keeper of Natural History in the British Museum, Dr. Shaw was promoted to that office. An abridgment of the Transactions of the Royal Society was begun in 1809, of which the department of natural history fell to the lot of Dr. Shaw. It is said he abridged 1500 distinct articles, which he rendered still more interesting than the originals, by the insertion of Linnæan and specific names, and by occasional annotations, and considerable references to subsequent authors of most celebrity, who had treated on these subjects. This was the last work in which he engaged. His time was wholly occupied upon the "Naturalist's Miscellany" and the "General Zoology," when death terminated his active and very useful life on the 22d of July, 1813, in the 62d year of his age. His illness was but of a few days' continuance: his senses and his recollection only forsook him with his breath. He died, as he had lived, with philosophic composure and serenity of mind, which neither the acute pains which he endured, nor the awful change which he was well aware he was about to experience, could in any degree disturb.

"As few men have left behind them a character more estimable, his name will be transmitted to posterity among those who give lustre to their age and country, who do honour to human nature by their virtues, and who contribute to the advancement of science, and the interests of literature, by their superior talents. Endowed by nature with considerable intellectual parts, and these improved by assiduous cultivation, he acquired a vast stock of general knowledge. His extensive information was treasured up without confusion, applied in his works with discernment, and communicated to every enquirer with cheerfulness and freedom." Gentleman's Magazine, 1813, p. 290.

SHAW, STEBBING, a divine and antiquary, was born at Stowe, in Staffordshire, in 1762, and educated first at Repton school, and afterwards at Queen's college, Cambridge, where he took his degrees and obtained a fellowship. In 1787 he made a tour in the Highlands of Scotland, of which he published an account without his name. In the following year he made another tour in the west of England, an account of which he also published. In 1789 he commenced, in conjunction with a friend, a periodical publication, called The Topographer, chiefly consisting of extracts made from curious books and MSS. in the British Museum. This work was discontinued in about two years. He next undertook the "History of Staffordshire," of which the first vol. in folio, was published in 1798: in 1801 the first part of the second volume was given to the public, and he died in 1803.

SHAW, in our *Old Writers*, a grove of trees, or a wood.

SHAW Fowl, an artificial fowl made for fowlers to shoot at.

SHAW'S Island, in *Geography*, a small island in the North Pacific ocean, at the entrance of Cook's Inlet. N. lat. 59°. E. long. 207° 16'.

SHAWABAD, a town of Hindoostan, in the circar of Rantampour; 35 miles S. of Suifopour.

SHAWANEE, a town of America, in the county of Randolph, and territory of Illinois, containing 830 inhabitants.

SHAWANESE, the denomination of a tribe of Indians who inhabit Louisiana, on the Mississippi and St. Francis. The number of warriors is 300; that of the inhabitants 800: their trade requires 1000 dollars of merchandise: the value of their returns is 3000; their commerce is carried on in their villages or settlements. The Indians

of this tribe have four towns on the Tallapoossee river. By the treaty of peace, Aug. 3, 1795, the United States agreed to pay this tribe a sum in hand, and 1000 dollars annually for ever in goods. They inhabit on the Scioto river, and a branch of the Muskingum, and have their hunting grounds between Ohio river and lake Erie. They are generally of a small size, rather handsome in their features, and a cheerful crafty people. Counselling among the elder, and dancing among the young men and women, take up a great part of their time.

SHAWANGUNK, a post-town in Ulster county, New York; containing 2809 inhabitants; 20 miles from Goshen and 12 from New Pelt.

SHAWGUNGE, a town of Hindoostan, in Oude, on the left bank of Dewah, opposite to Fyzabad.

SHAWGUR, a town of Hindoostan, in Allahabad; 32 miles N. of Gazypour.

SHAWIA, in *Botany*, received its name in honour of the celebrated oriental traveller, Dr. Thomas Shaw, who has given a catalogue, in alphabetical order, accompanied with rude plates, of the rarer plants, observed by him in Barbary, Egypt, and Arabia. The species amount to 632, and the catalogue is enriched with several synonyms, as well as occasional descriptions and remarks. His dried specimens are preserved at Oxford. The orthography of the name is attended with difficulty to foreigners, our *w* being as unmanageable to them, as their multiplied consonants are to us. Some of them blunder into *Schawia*, *Shaavia*, or *Shavia*. Perhaps the latter might be tolerated, were it not for the ludicrous ambiguity of *Shavius* itself, applied by facetious Oxonians to the above famous traveller and his namefakes.—Forst. Gen. t. 48. Prodr. 58. Schreb. Gen. 595. Mart. Mill. Dict. v. 4. Juss. 180. Lamarck Dict. v. 7. 148.—Class and order, *Syngenesia Monogamia*, Forster. *S. Polygamia-segregata*, Schreb. Nat. Ord. *Composite discoideæ*, Linn. *Corymbifera*, Juss.

Gen. Ch. Cal. Perianth imbricated, cylindrical, of five or six oblong scales; the three innermost longest, and nearly equal. Cor. of one petal, funnel-shaped, short; limb in five linear spreading segments. Stam. Filaments five, capillary; anthers united into a cylindrical tube. Pist. Germen oblong, below the corolla, superior with respect to the calyx; style thread-shaped, longer than the corolla; stigma divided, spreading. Peric. none, except the unchanged pervious calyx. Seed solitary, oblong. Down capillary, woolly at its base. Recept. naked.

Eff. Ch. Calyx imbricated, single-flowered. Corolla tubular, regular. Seed-down capillary, woolly at its base.

1. *S. paniculata*. Forst. Prodr. n. 1.—Native of New Zealand. We have seen no specimen of this plant. The younger Linnæus, in his copy of Forster's book, has made a note of its being referred by Banks and Solander to *Solidago*, under the name of *undulata*. Perhaps this is the most natural way of disposing of it; though if the calyx never contains but one floret, and is not in any way aggregate, the genus should stand in *Pentandria Monogynia*, along with *Corymbium*, at least according to the strict laws of artificial arrangement; but we should hardly, in either case, recommend such a measure.

SHAWLE, in *Agriculture*, a name applied to a shovel used in winnowing corn, in some places.

SHAWMGUNGE, in *Geography*, a town of Bengal; 18 miles W. of Rungpour. N. lat. 25° 27'. E. long. 88° 46'.

SHAWNAWAZ, a town of Hindoostan, in the subah of

of Moulton; 70 miles N.E. of Moulton. N. lat. $30^{\circ} 40'$. E. long. $77^{\circ} 38'$.

SHAWPOUR, a town of Bengal; 42 miles S.E. of Moorshedabad.—Also, a town of Bengal; 30 miles S. of Calcutta. N. lat. $22^{\circ} 5'$. E. long. $88^{\circ} 26'$.—Also, a town of Hindoostan, in the circar of Surgooja; 28 miles N. of Surgooja. N. lat. $23^{\circ} 35'$. E. long. $83^{\circ} 25'$.—Also, a town of Hindoostan, in Berar; 45 miles N.W. of Maltoy.

SHAWR, a town of Syria, in the pachalic of Aleppo, situated in a romantic country, where the river Orontes winds majestically through the plain. The town is populous, and has a good caravanferai. Adjacent to it is a good stone bridge of seven arches. These conveniences have been originally provided for the caravan, which rests here in its route from Constantinople to Mecca.

SHAWROWAH, a town of Hindoostan, in the circar of Chanderee; 45 miles W. of Chanderee.

SHAWSHEEN, a considerable stream of America, in Massachusetts, which rises in Bedford county, Middlesex, and passing through Billerica, Tewksbury, and Andover, discharges itself into Merrimack river.

SHAYE, a town of Hindoostan, in Guzerat; 33 miles N.E. of Junagur.

SHAYSHAR, a town of Syria, anciently called *Larissa*, on the Orontes; 10 miles N. of Hamah.

SHAZADABAD, a town of Hindoostan, in Allahabad, on the right bank of the Ganges; 30 miles N.W. of Allahabad. N. lat. $25^{\circ} 42'$. E. long. $81^{\circ} 43'$.

SHAZADPOUR, a town of Hindoostan, in Bengal; 25 miles S.E. of Nattore. N. lat. $24^{\circ} 12'$. E. long. $89^{\circ} 43'$.

SHEADING, a riding, tything, or division, in the Isle of Man; the whole island being divided into six sheadings, in every one of which is a coroner, or chief constable, appointed by the delivery of a rod at the annual convention.

SHEAF, in *Agriculture*, a bundle of corn, as bound up in the field. Sheafs are made of very different sizes in different places, but they are best when not made too large. See **HARVEST**.

SHEAF-Corn, such grain as is in the state of ear in the straw before being threshed out. It is sometimes employed in this state as fodder for different sorts of live-stock.

SHEAF of Arrows, a bundle consisting of 24 in number.

SHEAGUR, in *Geography*, a town of Hindoostan, in Myfore; 4 miles W.N.W. of Vaniambaddy.

SHEALLINGS, in *Rural Economy*, the portions of rich grass-land in the more hilly and mountainous parts of the country, which were fixed upon, and taken possession of, by the farming inhabitants at an early period of society, for the purpose of retiring to, and grazing their cattle-stock upon, at certain seasons of the year. Some snug well-sheltered spot in such hilly ranges was always fixed on in this intention, which was removed from one to another whenever the cattle had consumed the grass of it; huts or cots being provided for the accompanying persons to live in, who had the care of the animals, &c.; a trusty servant being usually sent before hand to secure the spot, and drive away any wandering and trespassing cattle from it. This person was denominated the *poindler*, perhaps because he was authorized to poind or confine troublesome stock, and fix the fine established for the trespass. In some cases there were more than one such spots, and where they were very rich, as near lakes, brooks, or in vallies, the grass was consumed in common by two or more of them associating together. The sheallings were by no means, as

some have supposed, depastured at random, but according to the flock, or as they were *foumed* out. See **SOUR**.

These shealling farmers lived with great simplicity, mostly on some oat-meal, and the produce of the dairy; having at the same time a constant occasional connection with their farms or home-steadings for the sake of performing different sorts of work on them, as collecting fuel, weeding flax, &c.: the last was mostly done by the women.

Though some of these sheallings still exist in the same way in the northern parts of Scotland, they are fast falling into disuse. In the room of such removals from place to place during the summer season, the distant grazings are frequently disjoined from the farmer's homestead, and left to shepherds, who live there all the year round, attending their flocks, in a modern house of substantial mason-work. In this mode of occupation, the landlord is said to draw more rent from his glens and mountainous property, and the farmers are at liberty, during the best season of the year, to ply the necessary and variety of labours wanted, for the improvement of their arable grounds, which, to industrious men, are never at an end.

The shealling season was, and is, as far as it yet continues, that of contentment, of festivity, of health, and of joy. The women are employed in spinning wool to clothe their families, and in making butter and cheese for part of their winter provisions. The youth are employed in fishing and wrestling, or athletic exercises, which put their swiftness and courage to the test, as a preparation for the more serious conflicts of a field of battle. When the various labours of the day are ended, the whole hamlet retires to rest, and to drown their fatigues in the soundest slumbers, on a bed of heath, the mellifluous fragrance of which perfumes the whole dwelling. See the *Agricultural Report* of the County of Inverness.

SHEALLY, in *Geography*, a town of Hindoostan, in the Carnatic; 10 miles S.W. of Tanjore.

SHEAR, in *Agriculture*, a provincial word, signifying the reaping of grain. It is also applied to sheep, as one-shear or two-shear, which signifies one or two years old.

SHEAR-Off, in the *Sea Language*. See **SHEERING**.

SHEAR-Water, in *Ornithology*, the *procellaria puffinus* of Linnæus, and called by some writers *avis diomedis*, is a bird about fifteen inches long, and thirty-one inches broad; the bill is an inch and three quarters long; the nostrils tubular; the head and whole upper side of the body, wings, tail, and thighs, are of a sooty blackness; the under side, from chin to tail, and inner coverts of the wings, white; the legs weak, and compressed sideways; dusky behind, and whitish before.

These birds are found in the Calf of Man, whither they resort in February; taking possession of the rabbit-burrows, and then disappearing till April; the young, which are fit to be taken in the beginning of August, are killed in great numbers, salted, and barrelled; and when boiled, eaten with potatoes. They quit the isle the latter end of August, or beginning of September; and there is reason to imagine, that, like the storm-finch, they are dispersed over the whole Atlantic ocean. In the Orkney isles this species, called the *lyre*, is much valued for food, and for its feathers. They are taken and salted in August for winter provision. Pennant.

SHEARDAY, in *Agriculture*, provincially the sheep-shearing.

SHEARING, a term applied to the cutting of grain, and to a sheep that has been once shorn. See **SHEEP**.

SHEARING, Sheep. See **SHEEP-Shearing**.

SHEARING, in the *Woollen Manufacture*. See **SHEERING**.

SHEARLING, another term commonly applied to a sheep that has been once shorn by sheep-masters.

SHEARPOUR, in *Geography*, a town of Hindoostan, in Bengal, on the Burhampooter; 82 miles W.N.W. of Dacca. N. lat. $24^{\circ} 53'$. E. long. $89^{\circ} 55'$.

SHEAT, or **SHEET**, a name by which some call a young hog.

SHEAT, or *Sheats*, in a *Ship*. See **SHEET**.

If the main-sail sheats are haled aft, it is in order to make a ship keep by a wind, but when the fore-sheets are haled aft, it is that the ship may fall off from the wind; and if she will not do it readily, they then hale the fore-sail, by the sheat, flat in, as near the ship's sides as they can; and this they call *flatting in the fore-sail*. When they say, *ease the sheat*, they mean veer it, or let it go out gently; but when the word is, *let fly the sheat*, they mean let it go all at once, and run out as fast as it can; and then the sail will hang loose, and hold no wind. The seamen say, when they would have the sheats of the main or fore-sail haled aft, *hally the sheats*. In a very great gale, or gulf of wind, there is another rope bent to the clues of the main-sail and fore-sail, above the sheat-block, to succour and ease the sheat, and this they call a *false sheat*.

SHEATS, in a *Ship*, also, are those planks under water which come along her run, and are closed into the stern-post: so also that part within board, in the run of the ship, is called the *stern-sheats*.

SHEAT, *False*. See **SHEET**.

SHEAT, *Overhale the*, in *Sea Language*, a word of command to hale upon the standing part of the sheat.

SHEAT-Anchor, in a *Ship*. See **ANCHOR**.

SHEAT of a Plough, in *Agriculture*, that part of the plough which passes through the beam, and is fastened to the share. It is sometimes called *sheath*.

And the sheat, or as it is sometimes called, the fore-sheat, there being another piece of timber behind it, which is called the hinder-sheat, should be seven inches wide, and fastened to the beam by a retch (a piece of iron with two legs), and by a wedge driven by it into the hole of the beam. But in the modern construction of this tool, the sheat is fastened without having recourse to these means. The angle contained between the sheat and the beam of the plough should be about forty-two degrees.

SHEATH, in *Botany*, is synonymous with *spatha*, *perichæthium*, and *vagina*. In the first instance it belongs to the single-leaved covering, bursting longitudinally, which Linæus reckons a kind of calyx, differing from a *perianthium* in being more or less remote from the flower. Such occurs in *Galanthus*, *Narcissus*, *Allium*, and others of the Hexandrous class; as also in *Arum*; and more especially in the natural order of **PALMÆ**. The **PERICHÆTIUM**, see that article, is the scaly sheath, or calyx, of Mosses. **VAGINA**, which will be further explained in its place, is the sheathing part of a leaf.

SHEATHING of a Ship, is the casing that part of her hull which is to be under water with something to keep the worms from eating into her planks.

It is usually done by laying tar and hair, mixed together, all over the old plank, and then nailing on thin new boards. But this hinders a ship's sailing; and therefore, of late, some have been sheathed with milled lead, which is much smoother, and consequently better for sailing; and also more cheap and durable than the other way. It was first invented by sir Philip Howard, and major Watfon.

The sheathing with copper is a still later invention, and answers better than any other.

It is very well worth the trying what the new stone pitch will do in this case; if it will defend from the worm, as perhaps it may, a ship might be paid with it cheaper than with the crown pitch; and it will not crack nor scale off, as that will do, but keeps always soft and smooth. It has been found to continue on thirteen months, and to remain very black and soft all the time.

SHEAVE, a cylindrical wheel, made of hard wood or metal, moveable round a pin as its axis in a mortise, as being used to raise or increase the mechanical powers, as a pulley, applied to remove or lift weighty bodies. Sheaves are either fixed in blocks, to form tackles, or let through the ship's sides, for affixing to lead the tacks and sheets on board, or in mortises cut through the masts, yards, caps, &c. to facilitate the working of the rigging, and outer ends of the cat-heads, to form the cat-tackle to raise the anchor to the bow.

SHEAVES, in *Rural Economy*, provincially the broken parts of the stems of flax which come away in dressing. Also the small bundles of grain in the straw.

SHEB, in *Geography*, a town of Nubia, on the borders of Egypt, on the route from Charjé to Cobbé; 175 miles N. of Charjé. This place is occasionally infested by a tribe of the wandering Arabs, called *Ababdé*, who come from the neighbourhood of the Nile. Sheb is marked by the production of a great quantity of native alum, as the name imports. The surface, from which the alum is found, abounds with a reddish stone; and in many places is seen argillaceous earth.

SHEBAT, in *Chronology*, the eleventh month of the Jewish ecclesiastical year, answering to part of our January and February.

SHEBBY, or **SHELBY**, as Morfe has it, in *Geography*, a county of Kentucky, in the United States, containing 14,453 inhabitants, of whom 2996 are slaves.

SHEBBYVILLE, a town of the forementioned county, containing 424 inhabitants, of whom 118 are slaves; so that the total in the county and town includes 14,877 inhabitants.

SHEBSHIR, a town of Egypt; 9 miles S. of Amrus.

SHEBUSTER, a town of Persia, in the most picturesque, and, at the same time, the most flourishing division of Azerbaijan, which lies along the N. and W. borders of the lake of Urumea, from Tabreez to the confines of Armenia. Shebuster is a large and flourishing town.

SHECATICA BAY, a bay on the S. coast of Labrador. N. lat. $51^{\circ} 20'$. W. long. $58^{\circ} 20'$.

SHECHALLION, or **SHICHALLIN**, a lofty mountain in the parish of Fortingall, district of Rannoch, and county of Perth, Scotland, is situated in the immediate vicinity of Loch Rannoch. It rises in a conical form, and hence derives its name, which signifies the maiden's breast. According to mensuration, its height is 3564 feet above the level of its base, which nearly coincides with that of the ocean. This mountain is rocky and barren; but is particularly remarkable from the circumstance of its having been chosen by Dr. Maskelyne, late astronomer royal, for ascertaining the power of mountains in attracting the pendulum. Sinclair's Statistical Account of Scotland, vol. ii. 1792. See **ATTRACTION of Mountains**, and **MOUNTAINS**.

SHECHINAH, in the *Jewish History*, the name of that miraculous light, or visible glory, which was a symbol of the special presence of the Deity. This shechinah, after it had conducted the Israelites through the wilderness, had its more stated residence in the tabernacle and the temple. See **ARK of the Covenant**.

For a farther account of this miraculous phenomenon, the

the reader may consult part ii. chap. 2. of Mr. Lowman's *Rationale of the Hebrew Ritual*.

Toland, in his *Tetradymus*, has attempted to prove, that this appearance had nothing miraculous in it, but was only a kind of beacon, used by the Israelites for their direction in their journey.

SHED BUILDING, in *Agriculture*, a term applied to any sort of slight temporary building.

SHED, *Open*, a sort of slight open building, for containing cattle, and various other uses in the farm-yard. See **CATTLE Shed**.

SHED, in *Rural Economy*, a term signifying to part, with the fingers and thumb, wool, hair, &c. as in salving sheep.

SHEDDING of the Hair, in horses, is the casting of the coat. See **MOULTING**.

SHEDIAC, in *Geography*, a harbour on the E. coast of New Brunswick.

SHEDMA, a province of Morocco, containing 550,000 inhabitants. This province produces wheat and barley; its fruits are not so rich as those of the north, or of Sufe; it abounds however in cattle. Of goats it furnishes annually an incalculable number, the skins of which form a principal article of exportation from the port of Mogodor; and such are often the animosity and opposition among the merchants there, that they have sometimes given as much for the skin, as the animal itself was sold for. Honey, wax, and tobacco are produced in this province; the two former in great abundance; also gum arabic, called by the Arabs "Alk tolh," but of an inferior quality to that of the Morocco district.

SHEDUAN, an island in the Red sea, about nine miles long and six broad. It is high and craggy, without wood or water; it is situated at about an equal distance between the two coasts of Egypt and Arabia. N. lat. $27^{\circ} 34'$.

SHEEDWOOD, in *Rural Economy*, provincially rough poles of top-wood. See **WOOD**.

SHEEHY MOUNTAINS, in *Geography*, the name of a range of mountains in the barony of Muskerry, and western part of the county of Cork, in Ireland. Of these and other mountains along the confines of Kerry, it is observed by Mr. Townsend, in his *Statistical Survey*, that though sometimes high, they generally want grandeur, and that the intermediate hollows are seldom marked with striking or romantic scenery. The adjoining lands are rude, rugged, and stony in the extreme, with a very scanty intermixture of any thing fair or fertile to relieve the eye amidst such a dreary waste.

SHEELAMoola, a town of Hindoostan, in Coimbatore; 14 miles S. of Errood.

SHEELIN, or, as Arrowsmith spells it, *Shillin*, a lake on the south of the county of Cavan, Ireland, situated between it and the counties of Meath and Westmeath. The river Inny flows from this lake, of which Mr. Edgeworth has said, in his report to the Bog commissioners, that it is in many places a fine deep river, and capable of being rendered navigable at a small expence, and to great national advantage.

SHEEP, in *Zoology*. See **OVIS**.

SHEEP, in *Agriculture* and *Rural Economy*, a well-known species or kind of live-stock kept by the farmer. The sheep belongs to the class of ruminant animals, or such as chew the cud, and of which there are different species, and varieties or breeds. And in its generic character it is distinguished by being with or without horns, which are hollow, wrinkled, turning backward, or intorted in a spiral manner. Eight front teeth in the lower jaw, in the upper none.

It is evident that sheep are animals of the utmost importance to mankind, whether considered in the light of affording food and clothing, or in that of the vast improvement and profit which they produce in the various systems of management to which they are subjected by the farmer; in some instances constituting a very large proportion, and in others nearly the whole of his dependence and support. There is also another point of view in which they appear equally advantageous and interesting, which is that of their becoming thus beneficial in situations and upon lands that must otherwise be nearly if not wholly useless. Also in the view of affording the raw material for one of the most extensive staple manufactures of the kingdom, the advantages which they afford are almost incalculable.

But besides the wool, the skins and other parts of these animals afford a variety of other equally useful and important articles and products, such as those of parchment, leather, glue, suet, and many others, which are of great value for different intentions and purposes in the arts and other ways, and which employ a great number of labourers in forming and preparing them. In short, there is hardly a part of the sheep that does not afford an useful and valuable product of some sort or other. In usefulness they may, of course, be placed at least next to, if not before, the cow. In disposition, almost all the improved breeds are extremely mild, tame, and gentle, which is a proof of their value as grazing stock: but those which have been less attended to, or which continue more in their native or original state, are much less tractable, as those which inhabit the downs, heaths, and mountains in different parts of the island.

The character of stupidity, want of sagacity, and of some other valuable properties, which the naturalist Buffon has given these animals, seems by no means well-founded. It is probably the offspring of prejudice, and the improper examination of the subject.

The increase or growth of the sheep continues to advance till at least three years old, when it is in general considered as in the most proper state for the purposes of the grazier, though it is employed in this way till a much later period, sometimes even till five or six, and also with the view of breeding; but an early maturity is a property of much consequence, especially for the grazier. Of sheep, the breeds or varieties that are dispersed over the globe are almost endless; even in this country they are so extremely numerous as scarcely to be described with any correctness. The characteristic circumstances by which they have been chiefly distinguished, are those of their possessing horns, or being wholly without them, and from the length or shortness and fineness of the wool or coat, as well as the situation in which they are chiefly found. It has been stated by lord Somerville, in his "System of the Board of Agriculture," that all the breeds of sheep in this kingdom may be arranged into two classes; those which shear the short or clothing, and those which shear the long or combing wool. And that the quality of the flesh in each class follows the character of the wool; the short-woolled sheep being close in the grain as to flesh, consequently heavy in the scale, and high-flavoured as to the taste; the polled long-woolled sheep more open and loose in the grain, and larger in size. And by the author of "The present State of Husbandry in Great Britain," they have been distributed under three general divisions, as below:

1. The mountain breed;
2. The short-woolled breed; and
3. The long-woolled breed.

And among the first are comprised several varieties, as the black-faced, which range on the mountains of Wales, Westmore-

SHEEP.

Westmoreland, Cumberland, Yorkshire, and those in the south, west, and north of Scotland, and in the Shetland islands; the Cheviot hills, in the south of Scotland and north of England; and the forest and common sheep of the last-mentioned country. In the second division are included those of Hereford, Dorset, Suffex, Norfolk, and some parts of Cumberland. And the third division comprehends all those varieties that are dispersed over the more rich and fertile parts of England, and which are distin-

guished under the titles of the Durham or Teefwaters, the Lincolnshires, the old and new Leicestershires, &c.

But others divide them into *long*, *short*, and *middle-woolled* kinds.

And a still more clear and concise view of the various breeds of British sheep, is afforded in the tabular form given by Mr. Culley, as enlarged and corrected by the author of the "General Treatise on Cattle," and others.

TABLE of the Breeds or Varieties of Sheep in England.

Names of Breeds.				Weight of Fleeces.	Wethers per Quar.	Age killed.
1. Teefwater.	No horns.	White face and legs.	Long wool.	9lb.	30lb.	2 years
2. Lincoln.	No horns.	White face and legs.	Long wool.	11	25	2
3. New Leicester.	No horns.	White face and legs.	Long wool (fine).	8	22	2
4. Cotswold.	No horns.	White face and legs.	Long wool (fine).	9	24	2
5. Romney-Marsh.	No horns.	White face and legs.	Long wool (fine).	8	22	2
6. Dartmoor or Bampton.	No horns.	White face and legs.	Long wool (fine).	9	25	2
7. Exmoor.	Horned.	White face and legs.	Long wool (coarse).	6	16	2½
8. Heath.	Horned.	Black face and legs.	Long wool (coarse).	3	15	3½
9. Hereford, Ryeland.	No horns.	White face and legs.	Short wool (fine).	2½	14	3½
10. Morf, Shropshire.	Horned.	Black and speckled.	Short wool (fine).	1½	12	3½
11. Dorset.	Horned.	White and speckled.	Short wool (fine).	3½	18	2
12. Wilts.	Horned.	White and speckled.	Short (mid.)	3	20	3
13. Berks.	No horns.	Black and white.	Long wool.	7	18	2½
14. South Down.	No horns.	Speckled and white.	Short wool.	2½	18	2
15. Norfolk.	Horned.	Black and white.	Short wool.	2	18	3½
16. Herdwick.	Horned.	Speckled and white.	Short wool.	2	10	4½
17. Cheviot.	No horns.	White face and legs.	Short wool.	3	16	4½
18. Dun-faced.	No horns.	Dun face and legs.	Short wool.	1½	7	4½
19. Shetland.	No horns.	Various coloured ditto.	Fine cottony.	1½	8	4½
20. Spanish.	Rams-horned.	White.	Short wool (super.)	3½	14	2½
21. Ditto crosses.			Ditto fine.	2¾	16	2

There are a few other breeds met with in different districts, as noticed below.

Since it is found by the grazier that the more an animal approaches towards perfection in its form, the better, in general, it is adapted to the purpose of fattening; it is obviously a matter of much importance to be well acquainted with the peculiar disposition and connection of parts which constitute such excellence or perfection of form: these have been already fully explained in speaking of the nature and principles of breeding animals, as well as in considering the nature and management of cattle. And the same thing is to be aimed at in sheep-stock; as the more any breed may approximate to such an excellence of shape, the more perfect it must be. A sort of model to be aimed at, in so far as shape is concerned, in the improvement of these animals, due attention being always had to other properties, has been given by Mr. Culley, in his description of a ram, and which may be seen under that head. (See RAM.) The nature and combination of the various points and parts should, of course, be well understood and impressed on the mind of the breeding and grazing farmer, in order that he may always rear or procure these animals to the greatest advantage.

The varieties of this most useful animal are endowed with different particular qualities, properties, powers, and propensities, which it is necessary to ascertain, in order for the farmer to draw and produce the utmost advantage possible from the combining, crossing, and rearing of them. All

the breeds of sheep are the most distinct while they are kept or left in the state of nature.

The common and usual descriptions of the several breeds are the following:

Teefwater Breed or Variety.—This is a breed of sheep said to be the largest in the island; it is at present the most prevalent in the rich, fine, fertile, inclosed lands on the banks of the Tees in Yorkshire. In this breed, which is supposed to be from the same stock as those of the Lincolns, greater attention seems to have been paid to size than wool. It is, however, a breed only calculated for warm rich pastures, where they are kept in small lots, in small inclosures, and well supported with food in severe winter seasons. The produce in weight of mutton is large, but then, from their requiring so much longer time and richer keep, and being admitted in so much smaller proportions on the acre, they are probably not, upon the whole, so profitable, even in situations where they can be kept with the greatest chance of success, as the smaller more quick-feeding breeds. In the ewes there is, however, a property which is of much consequence, which is, that in general they are very prolific, bringing two and frequently three lambs, and in some cases a greater number each, according to Mr. Culley. He gives the following description of the breed. The legs are longer, finer boned, and support a thicker and more firm and heavy carcase than the Lincolnshires; the sheep are much wider on the backs and sides, and afford a fatter and finer grained mutton. The weight *per quarter* in two-years old

SHEEP.

old wethers is from 25lbs. to 35lbs., and in particular instances to 55lbs. or more. The wool is shorter and less heavy than in that breed. However, the writer of the "Treatise on Cattle," thinks that the breed is nearly worn out; but suggests that there is a similar breed in Ireland.

This is a sort of sheep that has been little attended to, but which, when improved by proper crossing, it is supposed, would answer and pay well in districts where it could be well supported. In the Corrected Report of the State of Agriculture in the West Riding of Yorkshire, Mr. Parkinson supposes that an useful kind is capable of being bred by crossing the ewes of this sort with Dishley rams, in a careful manner. And it is added, that by the use of these, and those of the Northumberland kind, the quality of the wool and the mutton has not only been greatly improved, but the quantity of bone and offal much lessened; and, at the same time, the fattening property considerably increased; they becoming fatter at two years old than the others are at three. The wethers of this improved sort generally sell unshorn, at two years old, from 45s. to 55s. a-piece, and weigh from twenty-four to thirty pounds the quarter. They sell a great deal higher at the present time.

Lincolnshire Breed or Variety.—This is a breed of sheep which is characterized by their having no horns; white faces; long, thin, weak carcasses; thick, rough, white legs; bones large; pelts thick; slow-feeding; mutton coarse-grained; the weight *per* quarter in ewes from 14lbs. to 20lbs.; in three-year old wethers from 20lbs. to 30lbs.; the wool from 10 to 18 inches in length. And it is chiefly prevalent in the district which gives the name, and other rich grazing ones. But the writer of the work on Live-stock supposes that this breed is now so generally improved by new Leicester tups, that they are probably, in a great measure, free from those defects of the old breed, of which Mr. Culley, with much reason, complained, namely, slow feeding, from a looseness of form, and too much bone, and coarse-grained flesh. It must not, however, be denied, that a good old Lincoln has ever been, and the name, at least, still continues a great favourite at Smithfield, and the flavour of the Lincoln mutton has been generally held superior, as more savory than the Dishley. The *new* or improved Lincolns have now finer bone, with broader loins and trussed carcasses, and are among the best, if not actually the best, long-woolled stock we have. Many will recollect the ridiculous and indecorous squabble, some years ago, between two eminent breeders concerning these two breeds of sheep. About this time, they attempted to feed Lincoln sheep on the Essex marshes, and pretended the stock degenerated, which might happen from insufficiency of winter keep, or, if they were breeding flocks, from crossing with other breeds, an everlasting and unregarded practice in those not professedly breeding counties. This has been suggested as a breed only capable of being made fat on the richest grazing lands; but that in such cases it may probably be kept till three years old, with greater profit than the new Leicester kind. The proportion of bone to mutton is considerable, and the latter not very fine in quality. But the principal excellence of the breed is in the large quantity which it affords, which pays for their being kept longer before they are fatted. Such breeds as feed quicker should however be preferred by the farmer on most sorts of land.

New Leicester, or Dishley Breed or Variety.—This is an improved breed of sheep, which is readily distinguished from the other long-woolled sorts, according to Culley, by having fine lively eyes; clean heads, without horns; straight, broad, flat backs; round or barrel-shaped bodies; fine small bones; thin pelts; and a disposition to make fat at an early age; to which may be added a superiority in the

fineness of the grain and the flavour of the mutton to that of other sheep of the large long-woolled kinds. The weight *per* quarter in ewes three or four years old from 18lbs. to 26lbs.; in two-year old wethers, from 20lbs. to 30lbs.; the length of wool from six to fourteen inches. But the author of the "Treatise on Live-Stock," characterizes them as having a fulness of form and substantial width of carcass, with a peculiar plainness and meekness of countenance; the head long, thin, and leaning backward; the nose projecting forward; the ears somewhat long, and standing backward; great fulness of the fore-quarters; legs of moderate length, and the finest bone; tail small; fleece well covering the body, of the shortest and finest of the combing wools, the length of staple six or seven inches. The fore-flank, a term of the old school, current in the time of Lisle, or that flap of skin and fat appended to the ribs, and the inferior part of the shoulder, is remarkably capacious in this breed. New Leicester mutton, it is believed, is the most finely grained of all the large long-woolled species, but of a flavour bordering on the insipid. And it is added, that it is reported, and with the strongest probability, from the appearance of the stock, the fineness of the wool, and the grain of the mutton, that a Ryeland cross was a prime instrument in the Dishley improvement of sheep. Probably the root or foundation was Lincoln. In the ordinary and gradual course of improvement or alteration of form, it must have taken, it is thought, a long time and vast pains, to mould the animals into that artificial and peculiar shape which distinguishes this remarkable variety, unless indeed something nearly similar was suddenly and fortuitously chopped upon, as will occasionally happen when the fickle deity is good-humouredly disposed to spare our labours.

It must be observed, that the great advantages of this sort of sheep have been stated to consist in producing a better profit to the farmer, in proportion to the quantity of food consumed, than most others; in being more perfectly formed, and consequently more disposed to fatten quickly; in containing a much larger proportion of meat on an equal weight of bone; in thriving well on such pastures as would not support other sorts of the same size; in being capable of being kept or fattened in larger proportions to the acre, than other breeds of the same size of carcass; in the wool being more valuable, though less in quantity; in their being ready for the butcher in the early part of the spring instead of the autumn, by which there is a considerable saving in the summer's graze; and in the mutton, from the closeness of its texture, keeping longer than that of other equal-sized breeds. And that the principal defects are the fattening too much, and the mutton, in consequence, becoming less delicate in its flavour, than in that of other breeds that require a greater length of time in the process; the deficiency in the quantity of wool which they produce; and the not being calculated for the fold. It has also been supposed that their peculiar rounded form, from throwing much of the fat on the external parts, prevents their tallowing well internally; and that from their great propensity to fatten, they are liable to early decay, becoming old sooner than other breeds. There can however be no doubt, but that it is a valuable breed on pastures that are adapted to it, as is evinced from its rapidly making its way into different districts of the kingdom; but some suppose that the sheep are too small, and that, from the thinness of their skins, or pelts, they may not be so capable of bearing cold, which, however, experience does not appear to support.

The author of the "Treatise on Cattle," who seems chiefly to object to the Leicester breed, from its too great propensity to fatten, which, it is supposed, also abates the procre-

SHEEP.

procreative and lactiferous powers, says, "Pure Dishley sheep are by no means the most prolific, nor the best nurses." And adds, that the heads of the improvers having had time to cool, it is no longer boasted, that new Leicester sheep are able to subsist, and even thrive, on the shortest commons. In fine, it is contended, the merits of this stock as an improving cross, (their grand point of utility,) being so undeniably great, their disadvantages have been overlooked, and comparisons have been usually made with such only as had a strong need of improvement, in which the new Leicesters in course were sure to triumph. And further, that though the Dishley cross has made its way into every part of this island, to the Land's End, to the bottoms of the Welsh mountains, and of the Scottish Highlands, to Ireland, and even to Russia, its general success has been attended with various particular instances of failure, a remarkable one of which is given by lord Somerville, in his Facts, in respect to the Bampton or Western long-woolled sheep. The cross is sometimes very injudiciously used with short or carding wool stock, excepting where the intention is only forward lamb. On stock naturally good and improveable, this peculiar effect of the new Leicester cross has resulted, the improved have considerably surpassed, in the most valuable properties, their improvers. Of this many examples may be seen, it is supposed, in the improved Lincoln, Northumberland, and Midland county sheep.

The following is a table of the value of new Leicester sheep, at various ages, as given on the authority of different eminent breeders in the Lincolnshire Agricultural Survey.

Wether lambs, at 6 months, worth	17s.
————, at 12 months	30s.
————, at 18 months	35s.
————, at 24 months	45s.
————, at 30 months	45s.
————, at 36 months	55s.

But others, in different parts of the district, state it thus :

Leicesters, at six months old, worth	14s.
————, at twelve ditto	22s.
————, at eighteen ditto	28s.
————, at twenty-four ditto	35s.
————, at thirty ditto	45s.
————, and, if kept to thirty-six, would be	50s.

If a three-shear sells for 3*l.* it will be worth,

At 6 months, 28s.	
At 12 months, 35s.	Wool 9½ <i>lbs.</i>
At 18 months, 40s.	
At 24 months, 48s.	Wool 9 <i>lbs.</i>
At 30 months, 56s.	
At 36 months, 60s.	Wool 9 <i>lbs.</i>

According to the first of these tables, the scale of receipt is ;

	£	s.	d.
For the first summer	0	17	0
For the first winter	0	13	0
For the second summer, including 8 <i>lbs.</i> wool at 9 <i>d.</i>	0	11	0
For the second winter	0	10	0
For the third summer, including wool	0	6	0
For the third winter, including wool	0	16	0
	3	13	0
Three fleeces	0	18	0
As above	2	15	0

At 73*s.* they pay, *per annum*, 24*s.* 4*d.*

And it is remarked, that, at these prices, the last half year pays better than any ; if this is just, there is a great loss, by selling at 2½ years old ; for it is just at the conclusion of the worst half year there is.

Mr. Dawson of Berthorp, who has an excellent stock bred from Mr. Dalby's tups, last year sold 200 two-shear wethers at 3*l.* round. The following is his table of sales for seven years, of wethers of that age.

1790 Average	35 <i>s.</i>
1791	35 <i>s.</i>
1792	43 <i>s.</i>
1793	38 <i>s.</i>
1794	44 <i>s.</i>
1795	50 <i>s.</i>
1796	60 <i>s.</i>

He tuds threes. Average 2*l.* 3*s.* 6*d.*

And, at this average, he would thus divide it, by supposing the proportion to be,

	£	s.	d.
At 6 months	0	17	0
At 12 months	1	7	0
At 18 months	1	12	0
At 24 months	2	0	0
At 30 months	2	3	6

The advantages and disadvantages of the Lincoln and new Leicester breeds of sheep have been very fully considered in the Agricultural Survey of the former county ; and the results stated as below in the different districts of it.

Circumstances of comparison between the Lincoln and Leicester breeds of sheep.

Boston.	Lincoln better than Leicester, on general experience and particular experiment.
Brothertoft.	In experiment, very little difference.
Ewerby.	Leicester tenderer than Lincoln. Lincoln pay best for keeping to three-shear.
Hackington.	Last year of Lincolns pay best.
Ewerby.	Old sheep stand the winter better, and pay better than young.
Owersby.	Shearling Leicesters have, at Wakefield, sold as high as two-shear Lincolns. Difference of wool has been as 8 to 16. Leicesters tenderer in winter.
Normanby.	Lincoln fleece 2 <i>lbs.</i> heavier than Leicester. Leicester off-shearlings ; Lincolns two or three-shear, but the latter pay well, if kept to three-shear. Leicesters finer grained mutton. Leicesters rather thicker on the land, but Lincolns considerably larger. As much wool <i>per acre</i> from Leicesters as Lincolns.
Walcot.	Leicester fleeces, though not so heavy as Lincoln, sold, in one instance, for as much money.
Barton.	Leicester not tenderer in winter than Lincoln. Old breed of Lincoln used to go lean at two years old. Now, Leicesters fat at the same age. No difference in number on the same land. Wool the same.
Bonby.	Leicesters come to sale sooner, but will not bear cold, wet land in winter so well, nor heat or cold after shearing, as the Lincoln.
Barrow.	Five Leicesters where four Lincolns ; and Leicesters have refitted' hardships on the worst land better.

Brocklesby.

SHEEP.

Brocklesby.	Lincoln more profitable than Leicester.	Claypool.	Leicesters as fat at one year as Lincolns at two, and with less trouble, and one-tenth thicker. Do as well as Lincolns in winter on wet land.
Lumber.	Where a man can keep, by means of marsh, to three-shear, Lincoln most profitable, but not otherwise. Not more Leicesters kept on the same land. Leicester wool is a tod more than Lincoln. Leicester more liable to the fly.	Marlton.	Leicesters best, and run one-sixth thicker.
Cadney.	Leicester will feed a little faster, and run a little thicker.	Woolsthorpe.	Leicesters by far the best; but more apt to be barren than Lincoln. Drape ewes far more valuable.
Belesby.	Leicester one in six more on the same land, but both go at the same age. Leicesters hardier, and have less offal. Tallow equal; wool higher priced. Gives corn to Leicesters, but did not to Lincolns.	Grimsthorpe.	Leicesters travel best, and are the best; and much less loss in lambing; run one-third thicker.
Alesby.	Leicesters feed quicker, and have less offal; wethers and hogs less wool, but ewes equal, and on the whole more <i>per</i> acre; hardier, and bear driving better. Go off at the same age, but Leicesters fatter. Five kept instead of four. Lamb easier; necessary to give corn.	<p>A clear distinction is to be drawn, as the writer remarks, between the rich south-eastern district and inferior soils; for, upon the former, the information is strong in favour of Lincoln. However, in general, he should observe, that the new Leicesters are spreading very rapidly over the country, probably faster than they have done in any other, one or two only excepted, which may be attributed to the general goodness of the soil; for this breed makes a much more respectable figure here than it has done in various trials made in counties inferior to it in soil; and the breed driving out the Lincolns so much as it has done in the poorer parts of this county, is a fact that unites with this circumstance. The true Lincoln is a large sheep, and with a longer wool, and therefore demands better pasturage; where it finds such, there the old breed remains; subject, perhaps, to little more change than fashion may cause. Upon inferior land the Leicester establishes itself; and upon land still inferior in other counties, experiments prove unsuccessful for the same reason; that of the necessity of having a smaller size and shorter wool.</p> <p>But some of the original pure long-woolled polled breed of sheep, are still to be met with in the midland districts, which are a larger boned, longer formed, deeper coated, and more coarse stock than the improved sort. And that, from the coarseness and larger size of the head and neck in the old sort, the ewes lamb with more difficulty than in the true Dishley breed.</p> <p>The new Leicester sort of sheep is found a very advantageous breed on some kinds of land in the county of Oxford, as on the stone-brash; there are some farmers indeed, who think that no other sort comes nearly up to them, when all their valuable properties are taken into the account.</p> <p><i>Cotswold or Gloucester Breed or Variety.</i>—This is a breed of sheep which, according to a late writer on them, is of the fine combing wool sort, deriving the fineness of their fleece from the same source as the new Leicesters. This part of that county formerly, and within memory, bred, it is said, small fine-woolled sheep of the Ryeland kind, which in past times had been cotted, but the practice was discontinued. These sheep, being judged too small for the improving state of the county, have been, by gradual crossings with Midland long-woolled rams, chiefly Warwicks, completely changed from short to large long-woolled stock. The writer saw a picked lot of Cotswolds last year, he says, which answered the following description: long coarse head, with a particular blunt, wide nose; a top-knot of wool on the forehead, running under the ears; rather long neck; great length and breadth of back and loin; full thigh, with more substance in the hinder than fore-quarters; bone somewhat fine; legs not long; fleece soft, like that of the Dishley, but in closeness and darkness of colour, bearing more resemblance to short or carding wool. Although very fat, they had all the appearance of sheep that were full of solid flesh, which would come heavy to the scale. It is added, that it is said, some of those sheep have reached 40, and even 50lbs.</p>	
Humberston.	More pride than profit in the new sort. Leicesters 2lbs. less wool than Lincolns, and not better; but run one in ten thicker.		
Louth.	Leicesters feed quicker, and have lighter offals. No difference in hardiness. Lincoln best.		
Tathwell.	Lincolns and Leicesters being put together into the marsh, and sent thence at same time to Smithfield; the former yielded 4s. a-head more, and 5s. a-head more wool.		
Cookswold.	Marsh graziers all prefer Lincoln. No difference in number kept.		
Tathwell.	Lincoln wool 4lbs. heavier than Leicester. At two-shear, Lincoln heavier by 2lbs. a quarter; at three-shear, 5lbs. In tallow, 6lbs. at three-shear, in favour of Lincoln. In number <i>per</i> acre no difference. In hardiness, Lincoln best. Leicesters less wool, and less mutton <i>per</i> acre.		
Driby.	No difference in number kept.		
Spilsby.	Leicesters as fat at Lady-day, coming two-shear, as Lincolns at Lammas. Same number <i>per</i> acre. No difference in hardiness; Leicesters have corn.		
Horncastle.	Three-shear better than two, as sure to find more tallow.		
Asgarby.	Leicesters bred too fine; fine-headed ones do not yield wool enough.		
Frampton.	As many of one as the other <i>per</i> acre. Lincolns travel best, and pay best.		
Ranby.	Leicesters thicker on land, as five to four.		
Alderkirk.	In an experiment of the two breeds on the same land, of the same weight and age, the Lincolns considerably superior.		
Thoresway.	True Lincolns most saleable, and most profitable to breed.		
Sudbrook.	One-third more Leicesters on the same land.		
Rifeholm.	Boston graziers not judges, for they can get good Lincolns, but not Leicesters, as the breeders of these can fat them themselves. Leicesters run one-fourth thicker on the land. From six to twelve months old, rather tenderer than Lincolns; Leicesters travel best.		

SHEEP.

a quarter, at two years and a half old, giving 11lbs. to 14lbs. of wool each sheep, and being fat, they are indubitably among the largest breeds in England. A single dip, continues he, of new Leicester gives the Cotswolds a fulness in the fore-quarter; but any farther crosses of that kind, it appears, diminishes their size. The strange crosses of Wilts horned sheep has been resorted to in some parts, for no possible good purpose, he should apprehend, either to the carcase or wool; and it is probable, supposing such large stock profitable, that the chief alteration required by the Cotswolds, is to encourage length of staple in their fleece or wool.

In this breed the ewes are usually put to the tup, so as to have lambs at two years old, mostly producing two lambs each, in the proportion of nearly one-third of the whole, where kept well, which must always be done. They may be kept for breeding till three or four years old, if they are of the proper improved sort. But it is said that the wethers afford most profit when killed so early as at two years old, as they are apt to become too fat when kept longer.

The Cotswolds or Gloucesters, and the half Leicesters and half Gloucesters, and other mixtures of these breeds, are considered as very excellent sorts of sheep stock in many parts of Oxfordshire; they are of a good size, bear plenty of wool, and stand penning well. But penning or folding is not thought beneficial by some farmers, as more and better sheep may be kept without it.

The native Cotswolds, if they are any where to be found, would be, it is said, at two-shear from twenty-eight to thirty-two pounds the quarter: they are a long sort of sheep, not full in the sides, sharp in the chine, not full in the fore-flank, coarse in the bone, not straight but good in the hind-quarters; will not fatten so early as when crossed; and of wool, the two-shear wether affords three and a half fleeces to the tod. The new Leicester, it is contended, is calculated to correct every one of the deficiencies which have been noticed, and to bring a greater disposition to fatten. Between all Cotswold and all Leicester, the average difference of wool, it is said, is three pounds.

In Devonshire, some, it is said, have succeeded in the crosses of new Leicester upon the Cotswold, the equal breed of which is attempted to be preserved as much as possible. Wethers of this kind, at eighteen months old, will average nineteen pounds the quarter, and seven pounds of unwashed wool the fleece. When kept on for another twelvemonth, the age at which they are mostly killed in this county, this cross will attain the size of twenty-five pounds the quarter, and yield nine pounds of wool to the fleece. This wool is allowed by the staplers to be one penny the pound superior to that of the Exmoor, Bampton, South Devon, and Dartmoor sheep, yet still the common price of 10d. the pound is only allowed for it. In the young wethers of this breed, the loose fat is stated to be nine pounds, with nearly three pounds of kidney fat on each side. The larger wethers are said to produce thirteen pounds of rough fat, and four pounds of kidney fat on the side.

Romney-Marsh Breed or Variety.—This is a kind which is described by Mr. Young, as being a breed of sheep without horns; white faces and legs; rather long in the legs; good size; body rather long, but well barrel-shaped; bones rather large; and it is said that the weight *per* quarter, in fat wethers at two years old, is usually from 22lbs. to 28lbs. In respect to the wool, it is fine, long, and of a delicate white colour, when in its perfect state. On this Marsh 20lbs. of wool are supposed to be produced *per* acre. In this breed there is a property of arriving at the state of fatness at an early age, as well as that of producing a large fleece of fine

long combing wool, of course it is a valuable sort; however, from the size, and great weight of the coat, it is only capable of being supported and fattened on the rich kinds of marsh pasture: and on those which extend from Hastings to Rye, in Kent, according to the Suffex Agricultural Report, the graziers find it much more beneficial than the South Down; the marsh wethers fattening more quickly. The wool afforded by such fat wethers averaging six pounds, and in breeding ewes five pounds, but not equal in quality to the wool clipped from shearlings. And the author of the "Synopsis of Husbandry" remarks, that a convincing proof of the great value of this breed of sheep, as well as of the land on which they are fed, is seen in the manner of flocking, which in tegs is from four to seven *per* acre, in fattening wethers from six to eight, in barrens from two to three, and in couples three; which is certainly a great stock. And this is a breed that might probably undergo much improvement without crossing, by proper care and attention, and being less exposed in the winter season.

In the old Romney-Marsh breed, the sheep were remarkable for having large heads; for being large, long, and tubbelled; also for being large in their bone, long in their legs, and coarse in their wool; which form is still held in estimation by some, in consequence of improper prejudices, to the great injury of the grazier and community in general; but the pure breed of this sort, Mr. Price says, is distinguished by a thickness and length of head, a broad forehead, with a tuft of wool upon it, a long thick neck, a great length and thickness of carcase; being flat-sided, and having a sharp chine, tolerably wide on the loin, but the breast narrow, not deep, the fore-quarter not heavy or full, a good cleft; the thigh full and broad, the belly large and tubby; the tail thick, long, and coarse, the legs thick with large feet, the muscle coarse and the bone large; the wool long and not fine; coarsely on the breech: the sheep prove good, and are great favourites with the butchers. But this description is not now, it is said, so applicable as it was some time ago, when most of them had horns.

The same writer, in his account of the sheep management in this marsh district, has remarked, that the introduction of the Leicester breed has very perceptibly altered the form and properties of the original breed or stock of this tract, so that in a few years it will scarcely be discernible. And that it is probably the general opinion that it has been injurious to it, in reducing the size and value of the animal, as well as the quality and quantity of its wool, though it has still many advocates, and has certainly contributed much to its improvement. The principal objections which the graziers of this Marsh seem to have to the mixing of the Leicesters with their own breed, are, that they have seldom or ever twin lambs, which are very desirable and beneficial in this situation; that the lambs are more tender, and, of course, a greater loss liable to be sustained, especially in an open exposed tract of this sort; that their lambs do not winter so well as those of the native breed upon the uplands: they are much less hardy, consequently cannot stand cold and hardships so well, which is very disadvantageous; that their wool is not in such abundance, or so valuable, which is a great defect; that there is a want of proof in them, which renders them a great deal less saleable to the butcher; this may, however, be no disadvantage to the breeder or grazier, as it shews other more valuable properties and dispositions; and that they are too short in their bodies and legs, so as to stand too low in their pens at the market. These are, however, probably improved valuable properties, which must be rather beneficial than hurtful. Some improvement has, however, been given to the Marsh breed by the Leicester crosses, as those

SHEEP.

those of smaller and less coarse heads, a greater depth of carcass, and shorter and less coarse legs, better symmetry or form of several different parts, as well as of the whole animal.

There can, therefore, be no doubt but that this breed has been greatly benefited by the introduction of the new Leicester sort, and it is probable that it has not depended so much upon selection as the use of this new variety, as though the cry in the market is for the marsh kind, that form is carefully improved, and by no means preserved, although something of it may still exist. Something of the South Down sort is likewise discernible in this breed, it is said.

This breed of sheep is thought to be highly valuable for cold exposed situations, as being easily bred, and standing in need of no artificial food in the most severe winters, except a little hay; they are very hardy for their size, have now many improved qualities, and may probably be made the most profitable of any for rich pastures, as affording the largest proportion of meat at the least expence. In wethers, the general average is now from ten to twelve stone weight each; and in ewes, when fat, from nine to eleven.

Dartmoor, Devonshire, Bampton and Nott Breed or Variety.—This is a breed or sort of sheep, which is chiefly distinguished by having no horns; white faces and legs, thick necks, backs narrow, and back-bones high; sides good; legs short, and bones large: and probably without any material objection, being a variety of the common hornless sort. According to Mr. Culley, the weight of ewes on the average about 20lbs. a quarter: in wethers, at two years and a half old, 30lbs. Length of wool much the same as in the Romney-Marsh breed. It is a breed found to be prevalent in the districts from which it has derived its name. And it is supposed to have received considerable improvement by being crossed with the new Leicester or Dishley improved sort within these few late years.

Besides the forest from which it takes its name, this breed is met with in some other parts of the county. The Dartmoor wethers at five years old will average about 16lbs. *per* quarter, and produce from four pounds and a half to six pounds and a half of unwashed wool to the fleece. This breed of sheep, though they do not feed so quickly, when put to good keep, as the new Leicester sort, yet, when fat, they constantly prove the very best mutton, and never fail to command a superior price. They also stand the climate in a favourable manner, and the ewes are good nurses.

The old Devonshire dun-faced nott sheep were formerly held in high estimation, as a native breed of some parts of this county. It is, however, a crooked-backed, flat-sided,

coarsely boned and woolled animal, but which has been much improved by crossing with the new Leicester sort; its principal defects are by these means removed, and a greater disposition to fatten at an earlier period given; while at the same time, however, the fleece, as well as the weight of the carcass, has been lessened, the former from ten to eight pounds of unwashed wool the fleece, and the latter from twenty-two to nineteen pounds the quarter. In order to recompense which, the animal comes to market four months earlier; the wethers at two years old, with advantage; that is, after being twice shorn as sheep, and once as lambs, equals the average already stated. This issue once more crossed with the new Leicesters, will arrive, it is said, still earlier to the same perfection.

In the Bampton nott breed, the wethers will, at twenty months old, weigh twenty-two pounds the quarter, and shear six pounds and a half of wool to the fleece; also the same sheep, well wintered, and kept on for another twelvemonth, will average twenty-three pounds the quarter, and yield eight pounds of unwashed wool to the fleece. The price of the wool at present is about 1s. the pound.

The first cross of this breed with the new Leicester is fast growing into great esteem in this district, in consequence of its improving the form, and bringing the animal three months sooner to market; but though so far useful and desirable, any more of that blood is thought disadvantageous, as rendering them too tender while young, and to require too much care and nursing.

The Bampton nott crossed with the new Leicester is also a sort much approved of in several parts of the county, especially when carried to the fourth degree, or four parts of the Leicester to one of the native nott. This cross, it is said, comes earlier to market, and at two years old will generally average twenty pounds the quarter, and eight pounds of yolk wool to the fleece, which is worth about 10d. the pound. And the old Leicester cross upon the Bampton makes a large and handsome animal, which feeds kindly and tallows well within. The wethers of two years old will average, with advantage, thirty pounds the quarter, and shear ten pounds of yolk wool to the fleece. It is much valued in some places. But the new Leicester cross upon the same sheep, will in some situations bring forward wethers at twenty months old, weighing twenty-two pounds the quarter, with a shear of eight pounds of yolk wool to the fleece, both of which are at this time worth 10d. the pound, weighing, according to the custom of unwashed wool, twenty-one pounds for every score. This sort is highly valued by some in different parts of this county. The half Bampton cross is more hardy than the new Leicester sort, and suits some places better.

SHEEP.

TABLE of the different Breeds, Crosses, and Produce of the Sheep of this and neighbouring Districts.

Character of Breeds.	Age of Wethers when killed in Months.	Average Weight per Quarter, in Pounds.	Average Weight per Fleece, in Pounds.	Condition of Fleece.	Price of Fleece per Pound.	Value of Fleece.	Rough Fat in Pounds.	Kidney Fat in Pounds.	Total inside Fat.	
Native.										
Exmoor, horned, white legs and face, moderately long staple of wool, pure -	30	15	7	Yoak.	s. d. 0 10	s. d. 5 10	7	5	12	The washed wool of all the long-coated sheep is sold from 14d. to 15d. per lb.
Dartmoor, the same, the same -	30	16	8	do.	0 10	6 8	8½	6	14½	
South Devon Nott, brown face and legs, long wool, pure -	30	22	10	do.	0 10	8 4				
Bampton Nott, white face and legs, short wool, pure -	20 32	22 28	6½ 8	do. do.	0 10 0 10	5 5 6 8	10	7	17	
Neighbours.										
Dorset, horned, white face and legs, short wool, pure -	24	18	5	washed	1 6	7 6				These sheep are not sent to the forests.
Same, crossed with Exmoor	18	18	5½	do.	1 4	7 3	9	6	15	
Distant.										
South Down, pure -	24	18	3	do.	2 4	7 0				In most cases of a cross with the new Leicester upon long full fleeced sheep, a deficiency of wool is observable under the belly and breast of the animal.
Same, crossed with new Leicester.										
Leicester, old, crossed with Bampton -	24	30	10	Yk .	0 10	8 4				
Same, old, crossed with Exmoor -	36	24	6½	do.	0 10	5 5				
Same, new, pure -	18	22	6½	do.	0 10	5 5				
Same, new, crossed with Dartmoor.										
Same, new, crossed with Exmoor -	24	18	6	do.	0 10	5 0				
Same, new, fourth cross with South Devon	20	20	8½	do.	0 10	7 1				
Same, new, fourth cross with same -	18	18	6½	do.	0 10	5 5				
Same, new, crossed with Bampton -	20	24	8	do.	0 10	6 8	13	8	21	
Same, new, crossed with Cotswold -	18	19	7	do.	0 10	5 10	9	7	16	
Same, new, crossed with same -	30	25	9	do.	0 10	7 6	13	8	21	
Foreign.										
Merino, crossed with Ryeland -	24	15	6½	do.	2 9	18 6¾				
Same, crossed with same	24	15	5	do.	3 0	15 0				
Same, first cross with Exmoor -			5	washed	2 2	10 10				
Same, second ditto -			5	do.	2 9	13 9				
Same, third ditto -			5	do.	3 5	17 1				

SHEEP.

Exmoor Breed or Variety.—This is a sort of sheep which is characterized by having horns, white faces and legs; by being very delicate in the bone, neck and head, or what is sometimes denominated deer-necked; by the form of the carcase being indifferent, narrow, and flat-sided. According to Mr. Culley, the weight *per* quarter in wethers at two years and a half old, is from 15lbs. to 18lbs.; and the weight of wool much less than in the Devonshire breed. It is a small breed of long-woolled sheep, principally produced on or in the neighbourhood of the moor from which it takes its name, which is in the northern extremity of the above county. Mr. Lawrence supposes that in their present state they are by no means to be considered as a profitable sort of sheep-stock, either in what relates to flesh or wool; on which account it would be for the interest of the county to change them for the best fine-woolled breed. It is remarked by Mr. Billingsley, that this breed of sheep is frequently kept two or three years, merely for the annual profit of their fleeces, which often do not exceed more than four pounds in weight; and that from their being kept upon very bare and indifferent pastures while young, they are supposed by many sheep-farmers to be a very profitable sort of stock.

This horned breed has a moderately long staple of wool, which formerly, before the cloth manufacture of the county of Devon fled into Yorkshire, was much in demand by the clothiers of several different places. The fattened wethers of this breed, at three years old, will usually weigh about 15lbs. the quarter, and average $4\frac{1}{2}$ lbs. of washed wool to the fleece; which is worth at present about 13*d.* the pound. Attempts have been lately made in different places to improve the wool of this breed or sort of sheep, by a cross with the Merino or Spanish ram, and the results of the trials thus made are as below:

Quantity and value of native fleece	$4\frac{1}{2}$ lbs. at 1 <i>s.</i> 1 <i>d.</i> <i>per</i> lb. 4 <i>s.</i> 10 $\frac{1}{2}$ <i>d.</i>					
First crosses with the Merino	5	—	2	2	—	10 10
Second crosses on this produce	5	—	2	9	—	13 9
Third crosses on same	5	—	3	5	—	17 1

In which improvement of the fleece the carcase is said to be rather advanced than the contrary.

In the crosses of the old Leicester upon the Exmoor breed, the wethers, which are the produce at three years old, average about 24lbs. the quarter, and carry 6 $\frac{1}{2}$ lbs. of yolk wool to the fleece. The Exmoor sheep have also been crossed with the new Leicester; the wether produce of which, at two years old, will weigh 18lbs. the quarter, and yield 6lbs. of unwashed wool to the fleece: the price of the two latter 9*d.* the pound. Much loss is often, it is said, sustained in this last cross at the time of yearning, in consequence of the great size of the shoulders of the lambs retarding or preventing their exclusion. This will, however, be remedied in the produce of this cross.

The Exmoor breed is a hardy sort of sheep on wet exposed land while young. The ewes under such circumstances, in lambing, are also superior to the Bampton nodd kind.

Cornish Breed or Variety.—The true breed of this sort is said to have grey faces and legs, coarse short thick necks, standing lower before than behind, narrow backs, flattish sides, a fleece of coarse wool, weighing about two or three pounds, of eighteen ounces each; their mutton, which is seldom fat, from eight to ten pounds the quarter.

However, from the various crosses which have been introduced into the county at different times, in consequence of

the use of rams of the Exmoor, Dartmoor, North and South Devon, Dorset, Gloucester, and Leicester kinds, the pure breed of this description is, it is said, now become rare, but that, from the inferior nature and value of its properties the total extinction of it need not be lamented. The district is now capable of supporting a much better and more improved breed of this sort of animal.

Black-faced Heath Breed or Variety.—This is a kind or breed of sheep which, according to Mr. Culley, have large spiral horns, black faces and legs, a fierce wild-looking eye, short firm carcases, from 12lbs. to 16lbs. *per* quarter, covered with long, open, coarse shaggy wool, fleeces 3lbs. or 4lbs. each, wool worth at present about 8*d.* *per* pound. They are an active hardy sort, running with amazing agility, and best adapted, of all other breeds, to exposed, heathy, and mountainous districts; seldom fed until three, four, or five years old, when they feed well, and make the finest mutton, having a high-flavoured gravy. The sheep of this wild-looking breed are natives of the north-west of Yorkshire, and of that mountainous tract of country adjoining the Irish sea, from Lancashire to Fort William: they have been of late years introduced into the Western highlands of Scotland.

And the writer of the "Treatise on Live Stock," supposes the black-faced Linton, or short sheep of Scotland, to be a variety of the Heath sheep. They have been crossed with the Cheviot breed, and Mr. Culley, it is noticed, recommends a Dishley cross, meaning, doubtless, for the use of the low lands. If he may be allowed to give an opinion, he would, for upland situations, recommend a Spanish cross, with good winter management, in preference to all others. It is disgraceful, he contends, to the rural economy of Britain, that so excellent a breed of sheep should be needlessly compelled to brave the rigour of the seasons, in such loose, ragged, and beggarly clothing, when they might, with a few years' pains, and without any deterioration of the carcases, produce a fleece of high value and consequence to the manufactures of the country. And he adds, that Mr. Henry King, salesman of Newgate market, and an eminent grazier, informs him, that he once fed a lot of these northern heath sheep, and made excellent mutton of them, about 16lbs. a quarter; but that their wool hanging down their quarters like goat's hair, was so execrably bad, that it could be sold only for mop yarn.

But what are termed *black-faced*, or *short sheep*, are said to have been originally short-woolled, the present length of it having proceeded from crossing; and it is not well ascertained whether they are a native Scotch breed, or have been introduced from the moor-lands of Yorkshire. Besides the objection to these *black-faced* sheep, on the ground of the coarse loose nature of their wool, they are said to be subject to the *braxy*, a disease that was unknown in the Highlands before their introduction. And it is remarked, in the able Agricultural Survey of East Lothian, that the kind of sheep bred and most generally kept in Lammernuir, is the black-faced, or more properly, what is called the *brooked* faced, a sort of dirty-looking mixture of black and white; they are for the most part horned; when they are fed, the wethers weigh from 10lbs. to 12lbs. *per* quarter, and the ewes from 8lbs. to 10lbs. on an average. It will take eight or nine fleeces of the ewes and hogs, and six or seven of the wethers, to make a stone of seventeen pounds (twenty-one ounces to the pound); the quality, and consequently the price, vary much. The difference of quality may result from various circumstances; it is owing partly to the quantity of tar put upon the sheep in salving; partly, it is supposed, to the situation in which they pasture, as those fed on high grounds, and coarse mossy herbage, are thought to have inferior wool; and partly to the

general

SHEEP.

general attention and care which farmers bestow upon their flocks, in which some are greatly superior to others. But the black-faced sheep seem, the writer thinks, to be capable of very considerable improvement; it does not, indeed, appear, that much has been done for improving that breed, which certainly places them in an unfavourable situation, when their merits come to be discussed in opposition to others which have received great attention. There can hardly be a doubt that the weight of the carcase and the quantity and quality of the wool might all be increased, by sufficient care to select the strongest, healthiest, and best feeding among them for the purpose of breeding. It has been observed, that those which feed best have the greatest quantity of wool, and generally of the best quality; and it is natural to suppose that it should be the case, as they must be the healthiest and strongest.

Herefordshire, Rofs, or Ryeland Breed or Variety.—This is a sort of sheep which is distinguished by the author of the "Treatise on Live Stock," by the want of horns, and having white legs and faces; by being small in size; and the wool growing close to the eyes; by the carcase being pretty well formed; and by the excellence of the mutton. Weight *per* quarter from 10 lbs. to 18 lbs. Wool fine and short, the lean poor-fed sheep producing the finest. It is the true breed of this sort of sheep which is properly denominated Ryelands. In the Agricultural Report of that district, they are said, in symmetry of shape, and the flavour of the meat, to be superior to most flocks in the country. They lamb in February and March. It is a breed which, Mr. Knight says, is found to be remarkably easy in respect to food, but which, in its management, requires crotting in the winter season, and being fed with hay or peas-haulm. In some cases they are housed all the year round in the night-time. The cots are low covered buildings, proportioned to the extent of the flocks. In the Herefordshire Agricultural Report, it is observed that the crotting materially contributes to the health of the animal and the fineness of its fleece. The quantity shorn from each of the small original breed does not average more than two pounds; but the quality is such as almost to rival that imported from Spain. The price has often been as high as thirty-three shillings the stone of twelve pounds and a half untrinded, when the coarse wool has brought but ten or twelve shillings. They are said, by Culley, to fatten the best at four years old. The Archenfield, or true Herefordshire breed, is said to afford the finest wool, except the Spanish. It is suggested by Mr. Knight, that the disposition of sheep to fatten in the north-west part of that district is in the proportion to the fineness of the wool; but he is not certain of its being so in this breed; however, it seems to him that where the wool is close and fine, there are many advantages; less nourishment is drawn from the body in its support than in the contrary case. The long coarse-woolled fleece admits the rain more freely, and by dividing on the back lets it down to the skin. It also takes in a larger weight of water, which must more inconvenience the animal already heavily loaded. The fine close fleece of this breed admits the water with difficulty, even when immersed in it in washing, and is never wet through by rain. On account of the closeness of the texture, it only lodges on the outside, and is easily removed by the animal shaking itself. Besides, a fleece of this kind is much more warm and light. For these reasons it is supposed that no breed of sheep in the island is capable of subsisting on so small a proportion of food as this.

This animal, in Mr. Knight's opinion, appears to be much more patient of hunger, and to keep itself in better condition on a less quantity of food than any other which he has had

an opportunity of observing. To the great scantiness of the pasture on which it is usually condemned to feed, is to be attributed the fineness of its fleece; for the quality of this becomes immediately impaired by a copious supply of food; and this circumstance should be attended to, in every county where these sheep are introduced.

Some attention has lately been paid to its improvement, and although the wool is somewhat less fine in its quality than it formerly was, it is still the finest in the island, with the exception of the Spanish sort recently imported; and the animal must be allowed, on the whole, to have been considerably benefited. The quantity of wool afforded by the improved sort of Ryelands, although increased, is still far from large; a three-years old wether rarely yielding more than three pounds and a half. But as a large number of sheep will subsist on a small portion of ground, and the wool is still worth two shillings and sixpence the pound, its value, compared with the quantity of food consumed by the animals, is probably much greater than that afforded by any other breed.

And the Ryeland sheep readily acquires, on a very moderate pasture, that degree of fatness which renders its flesh more acceptable, but it is wholly incapable of being loaded with fat in the manner of Mr. Bakewell's. It appears to him to fatten somewhat more quickly than those he has seen of the South Down breed.

In the Agricultural Survey of Herefordshire it is suggested, that a cross between the Ryeland and real Spanish seems the most probable mode of adding to the fineness and value of the wool; and amongst many spirited breeders who are now making the experiment, colonel Scudamore of Kentchurch, sold the fleeces of a flock so crossed at forty shillings *per* stone, in the fair at Rofs, in the course of last year. The first stage of the cross materially detracts from the beauty of the Ryeland's form, but by continued attention, this objection will probably be removed, and the flavour of the mutton is uninjured. Lord Somerville has found that they feed quickly, and weigh heavily, although their form be not attractive; but perhaps form in this animal is of little comparative consequence. An ox rarely fattens well, or has flesh of good quality, unless it be in one particular shape; but sheep fatten well, and the meat is of prime quality in those of very different forms. Two Leicesters which were fed by Mr. Hewer, of Abergavenny, and slaughtered before the Agricultural Society of this county in March last, weighed no less than fifty-one pounds in each fore-quarter, and forty-five in each hind-quarter. But notwithstanding this great weight, the Leicesters are often found less heavy than they appear to be, whilst the half Spanish weighs more than is generally expected from its size.

A cross of the Merino on the Ryeland breed has been tried in some parts of Devonshire with an appearance of success. The three-years old wethers of this cross, when fattened to their frame, being, it is said, estimated to run from fourteen to sixteen pounds the quarter, and to throw off from three pounds and a quarter to four pounds of washed wool to the fleece. In experiments made by some on this cross in other parts, it appears that two-years old wethers of the first cross will weigh about fifteen pounds the quarter, and shear from six pounds and a half to seven pounds of wool in the year to the fleece, which is worth 2s. 9d. the pound. The sheep are, however, greatly exposed to the foot rot.

The cross between the Ryeland and the Spanish has been made in some other parts, which has completely succeeded as to fleece, as the produce of the third cross of this breed readily sells for 3s. 6d. the pound; it is, however, objected to by many on account of its not affording an equal acreable proportion of mutton with the native sheep.

SHEEP.

In crossing this breed with the Dishley, an useful kind of sheep has, however, been produced, both the wool and carcase being increased in weight, but much injured in respect to fineness; and it is contended by some, that the breed is rendered much less hardy by it.

Warton Cragg Breed or Variety.—This is a sort or variety of sheep which is principally met with in the district of the above name, and that of Silverdale, in the northern part of the county of Lancaster. These cragg sheep are greatly esteemed for the fine flavour of their mutton, their ready disposition to fatten, and the fineness of their wool. They are a close compact well-made breed of sheep, commonly with white or mottled black and white faces and legs. Their fleeces are short and close in the wool, which usually sells high. Their pasture is chiefly that of the poor short rocky lime-stone kind. They are deserving of more attention than has hitherto been bestowed upon them by the farmers of the neighbourhoods where they prevail.

The Shropshire or Morf Breed or Variety.—This is a sort which, according to the writer on live stock, has small horns, with speckled dark or black faces and legs; they have the full character of real fine-woolled sheep, and have been, for centuries, bred in Shropshire, Staffordshire, Worcestershire, and the vicinity. Their fleece is nearly all fine, and, it is said, superior to Ryeland wool, since the crossing which has taken place in that stock. Mr. Pitt, of Pendeford, in a letter to lord Somerville, dated 1799, estimates the extent of Morf common, or waste, at 3600 acres, and the number of sheep summered thereon, at 15,800, to the annual profit of fifteen shillings *per* acre in wool only, on a moderate calculation, eight fleeces and a half to the stone of 14 lbs. Nothing is reckoned on account of carcase, as the sheep have some extra keep during winter. It is added, that the Shropshire commons produce good fine wool, but none equal to Morf by sixpence a pound.

The Dorsetshire Breed or Variety.—This breed is known by having the face, nose, and legs white, head rather long, but broad, and the forehead woolly, as in the Spanish and Ryeland sorts; the horn round and bold, middle-sized, and standing from the head; the shoulders broad at top, but lower than the hinder quarters; the back tolerably straight; carcase deep, and loins broad; legs not long, nor very fine in the bone. Weight *per* quarter in wethers, at three years and a half old, from 16 lbs. to 20 lbs. Mr. Billingsley says, that the wool is fine and short. It is a breed which has the peculiar property of producing lambs at any period in the season, even so early as September and October, so as to suit the purposes of the lamb-suckler. It has been found to answer well in some of the midland districts, and, from its close make, to be equally advantageous with almost any other. It is, however, supposed capable of improvement by being crossed with rams of a larger size. There are varieties of it met with in several districts. And it is said by some, that the Dorset breeders pay great attention to preserve the colour of their flocks from mixture, since white lambs are the most esteemed in the London markets, from a presumed superior delicacy in the meat. It is believed this is one of the best breeds in England, if not superior to all others, considering its various qualifications. Their property of bringing twins, and making our highest priced house lamb, must be considered first; they are both good hill sheep and pasture sheep, and their flesh is an excellent medium between the delicate mutton of the hills, and the rich and juicy meat of the best lowland sheep. The later Dorset lambs, when fattened, make the earliest grass lamb. By the practice of this county, the lambs which the breeders retain are shorn at Midsummer, having been taken from the ewes in May; produce of wool, one pound to a pound and a half each, the

price a penny *per* pound nearly, under the price of sheep's wool. A three-shear sheep may produce four or five pounds of middling fine wool, which it would be highly advantageous to improve to the utmost, on this excellent breed.

This is a breed, or sort of sheep, which seems to prevail among the generality of farmers in the high lands, and some other parts of the county of Devon, which border on the above, in which they are found to answer very well.

And there is a breed or variety nearly connected with these in the Mendip hilly district. They are smaller than that breed, having smaller horns, more deer-headed, the wool less in weight; the mutton excellent in its flavour. It has been observed by the author of the "General Treatise on Cattle," that in the West Riding of Yorkshire, and in the adjoining parts of Westmoreland, they have a breed of horned and white-faced sheep, bearing a strong affinity to the Dorsets; they are called *Craven* and *Wensleydale* sheep, but more generally *Penifton*, from the market town where they are sold. They are a good down or hill sheep, in their pure state, and give a fleece of coarse short wool, weighing between two and three pounds, the carcase good mutton, about fifteen pounds *per* quarter. They are variously crossed in that riding, with Cheviot, Dishley, and Northumberland tups; with the two last, for the purpose of making pasture sheep, in which case the weight of carcase is increased to twenty or thirty pounds *per* quarter. In the north, this breed is commonly crossed with the Heath sheep, which gives them black or grey faces and legs, with sometimes a black spot on the top of the neck, the wool coarse and open, instead of being close and thick set upon the skin, as a defence against the severity of the climate of that hilly and exposed country in which they are fed; defects for which the remedy is obvious. Ryeland tups have been tried with the Penifton ewes, a cross which made a considerable improvement.

The Wiltshire Breed or Variety.—This is a sort which has sometimes the title of *horned-crocks*. The writer on live stock distinguishes the breed, as having a large head and eyes, Roman nose, wide nostrils, horns bending down the cheeks, colour all white, wide bosom, deep greyhound breast, back rather straight, carcase substantial, legs long, bone coarse, fine middle wool, very thin on the belly, which is sometimes bare. He supposes, with Culley, that the basis of this breed is doubtless the Dorset, enlarged by some long-woolled crosses; but how the horns come to take a direction so contrary, is not easy, he thinks, to conjecture; he has sometimes imagined it must be the result of some foreign, probably Tartarian, cross. The old Hertfords were, he says, supposed a kindred breed with the Wilts, but at present, the few of this kind bred in Herts are of smaller size, longer and coarser wool. These large and leggy Wilts' sheep work well in the fold, and have always had the character of good thrivers at corn, oil-cake, and the best meat, making very large mutton, and very deep in flesh, which is high-flavoured, yielding the dark-coloured gravy. The breed is, he adds, every where on the decline, generally supplanted by the South Downs, of which the farmers find they can, on the same quantity of land, keep more than one and a half, for one of the Wilts, the former, moreover, producing both better mutton and better wool. The disease called the *goggles*, is said to be peculiar to the Wilts sheep. It is stated, that this breed has been long used, more or less, in the counties bordering on Wilts, and in Surrey, Kent, Herts, Essex, and Middlesex. But that it is a breed not worth preserving; perhaps the only thing to be done with it to advantage, is to cross it with the Merino. The Hampshire variety of this breed is said, for what reason he knows not, to be more hardy. It is a breed, however, which is esteemed in some places.

SHEEP.

The Berkshire Breed, or the Variety called Notts.—This is a sort which the same writer describes by having considerable length and bone, straight made like horses, full fore-flank, Roman faced, with distinct black spots, high on the leg, thick fleece, of considerable length. He supposes them to class with the long-woolled breeds, and to probably bear some affinity to the breed of Oxfordshire, which is, he is told, a peculiar variety.

The peculiar qualities of the Berkshire nott breed seem to be its great size, height on the legs, and weight when fattened. It would appear, contrary to the opinion of some, that this breed is well suited for the strong low lands of its native district, though the South Down sort are fast supplanting it in many places, probably without sufficient experience of them in such situations. In contrasting them with the horned Wiltshire sheep, it is found by some that the polled Berkshire or nott sort are as certainly more properly adapted to the low and cold lands, as they are proved to be more hardy for the fold, to fat sooner, and to be less liable to injury from the fly, than the horned sheep. When fat, the sheep vary as much as from fourteen to forty pounds the quarter, in weight. These polled or nott sheep are, however, not of so large a size as the horned sort of the same district. The fleece of this breed of sheep is not fine, and on the average it will take eight of them to a tod of wool. The mutton is rather coarse, as in all large breeds of animals. The utility of crossing this breed is by no means decided. Some advise to breed from the best of this sort, but to cross for fattening. Crosses are, however, very common between many different sorts, as between the notts and the Wiltshires, the Cotswolds, the Leicesters, and different mixed breeds.

The Berkshire nott breed is much valued in some parts of Oxfordshire, especially for regular breeding as well as standing the fold. They are strong, active, and able to travel, and fold unusually well; against which good qualities they are, however, long in fattening, &c. The crosses with the Leicester improves them considerably, still they are fast giving way to the South Down and some other breeds.

And it is observed in the Norfolk Agricultural Report, that the Wiltshire sheep have proved, in various trials, an unprofitable breed, as well as the Norfolks; but it is remarkable that for turnips, no sheep are said, by many practical and experienced husbandmen, to pay better, if so well. In Hertfordshire, many who turnip-feed adhere to that breed, who admit the South Downs to be a superior sort for grafs-feeding.

Heath-Croppers or Windfor Forest Breed or Variety.—This is a small ill-shaped breed of little value, found abundantly in the parishes which lie within the precincts of the forest of Windfor in Berkshire. It is a breed which affords a very sweet kind of mutton. A quarter of it will weigh about twelve or fourteen pounds. And in regard to the wool, about thirteen fleeces will make a tod. It is of equal value with that of the South Down breed. The term *heath-croppers* is very commonly, though vulgarly, applied to sheep of this breed.

The South Down Breed or Variety.—This is a very valuable sort of sheep, which Culley has distinguished by having no horns, grey faces and legs, fine bones, long small necks, and by being rather low before, high on the shoulder, and light in the fore-quarter, sides good, loin tolerably broad, back-bone rather high, thigh full, twist good, mutton fine in grain, and well-flavoured. Wool short, very close and fine, in the length of the staple from two to three inches. Weight *per* quarter in wethers at two years old 18 lbs. It is a breed which prevails on the dry chalky downs in Suffex, as well as the hills of Surrey and Kent, and which has lately

been much improved both in carcase and wool, being much enlarged forward, carrying a good fore-flank; and for the short less fertile hilly pastures is an excellent sort, as feeding close. The sheep are hardy, and disposed to fatten quickly; and where the ewes are full kept, they frequently produce twin lambs, nearly in the proportion of one-third of the whole, which are, when dropped, well-woolled. The wethers are capable of being disposed of at an early age, being seldom kept longer than two years old, and often fed at eighteen months; which is a very valuable property. But according to the Suffex Agricultural Survey, the ewes are commonly kept till between four and five, and found to answer well to the graziers in the neighbourhood, as well as the farmers in Norfolk and the adjoining counties, in the place of home-bred sheep, as being more expeditious feeders, and equally adapted for the purpose of the fold. It has been observed, that it is in fact a breed of sheep which, from the compactness of their form, and their legs being shorter, considerably outweigh both the Dorset and Norfolk breeds, in proportion to the size of the carcase, being heavy in a small compass. Their hardiness is estimated according to the darkness of the colour in the face and legs; but as there is inconvenience in the produce on this account, from the wool, especially about the head and neck, becoming spotted with black, and thereby thrown aside by the stapler, as only of half the full value, a middle degree of colour may be best. As an open country breed, they are sufficiently gentle and tractable. They are capable of travelling well, and of resisting the effects of exposure to cold. The wool is scarcely, if at all, inferior in fineness to that of the Herefordshire kind; as the practice of sorting, which is common in that district, is not in use on the Downs. The excellent properties of this breed have been brought fully to the notice of the farmer, by the great patrons of improvement in Bedfordshire and Norfolk, and its superior merits on trial have been such as to have induced the sheep-farmers in various districts to introduce them in preference to other breeds. It is stated, in the Annals of Agriculture, that they have been found to consume less food, in proportion to weight, than the Norfolks, yet keeping in better order. Young sheep produce the best lambs; the crones are of course constantly sold at four or five years old; and if it were done earlier, it is supposed, it would be more profitable. The author of the "General Treatise on Cattle" suggests, that the most noted variety is that of Mr. Ellman, of Glynd, in Suffex, who, he believes, first enlarged the Down breed, by the aid of polled or *nott* Berkshire tups. From this enlarged cross, he understands, originated the flocks of the duke of Bedford and Mr. Coke; the South Downs of Mr. Coke being generally acknowledged the largest and finest in England, a very pregnant proof of which was given at lord Somerville's cattle show, in a two-shear Holkham South Down wether, which weighed more than 40 lbs. *per* quarter. Although quick and early feeders, they tallow within remarkably. And in answer to the complaints of those who knew the old Down sheep, that their wool is become so much coarser than formerly, from the modern habit of feeding the sheep with rape, cabbage, and oil-cake; they seem totally to forget the middle and long-woolled crosses, by which the carcase of the South Downs of the present day has been enlarged, and their weight of wool increased, and rendered more coarse. The mutton is still excellent, although probably not so high-flavoured as the old Down mutton. It is also further suggested, that it would be difficult to point out any part of the island for which this breed would be unfit, but extremely easy to name a vast number of districts where it would be a most advantageous substitute for the native flocks. It is supposed, that all the South

SHEEP.

South Downs want is the noble covering of a Spanish fleece, and how little their carcase would suffer by the cross, has, it is said, been demonstrated by lord Somerville, in the exhibition of a very fine ewe, large enough for any purpose, half Spanish and half South Down. But in order to form a comparison between the Norfolks and South Downs, Mr. Overman of Norfolk, on March 27th, 1799, took from turnips twenty-four two-years old Norfolk wethers, and ten South Down of the same age, having always lived together from the time they were lambed, and two hours afterwards they weighed as follows :

	ft.	lb.		ft.	lb.	oz.
24 Norfolks from the field,	264	7½		11	1	15
Average	-	-		10	10	7
Ditto after fasting 28 hours,	237	13		0	5	8
Average	-	-				
Difference	-	-				
10 South Downs from the field,	109	4		10	13	0
Average	-	-		10	8	9
Ditto after fasting 28 hours,	106	2		0	4	7
Average	-	-				
Difference	-	-				
One of each lot slaughtered.						

Norfolk.			ft.	lb.	£	s.	d.
Mutton	-	-	6	10 at 6d.	2	7	0
Tallow	-	-	1	2½ at 5d.	0	6	10½
Head and pluck	-	-	0	10½	0	0	9
Skin	-	-	0	9¾	0	1	0
Wool	-	-	0	3¾ at 17d.	0	5	4
					3	0	11½
Blood	-	-	0	6¼			
Entrails	-	-	0	11			
Lofs	-	-	0	0¾			
Live weight	-	-	10	12½			

South Down.			ft.	lb.	£	s.	d.
Mutton	-	-	6	8½ at 6d.	2	6	3
Tallow	-	-	0	13½ at 5d.	0	5	7½
Head and pluck	-	-	0	10	0	0	9
Skin	-	-	0	10	0	1	0
Wool	-	-	0	7½ at 18d.	0	11	3
					3	4	10½
Blood	-	-	0	7			
Entrails	-	-	0	11			
Lofs	-	-	0	0½			
Live weight	-	-	10	12			
Norfolk	-	-			3	0	11½
Down superior by	-	-			0	3	11

Besides, these Norfolk sheep losing 11 lb. 10 oz. more of their respective weight (taken full and empty) is a strong circumstance against them. The Downs are run much thicker on the land than the Norfolks. And Mr. Hill of the same district estimates the difference of stocking between Norfolks

and South Downs, at one-third in favour of the latter, in number, in better condition, and of greater weight, both in wool and carcase; all fairly attributable to the superiority of the breed, and free from any charge of lessening cattle, &c. When his flock was of Norfolks, scarcely one in a score had a whole fleece; but now they are South Downs, scarcely one in a score is broken. And Mr. Blythe of Burnham had, four years ago, a flock of between five and six hundred Norfolks: he has now one thousand South Downs on the same land, and has likewise double the wool from his land stocked with South Downs, to what he clipped when under Norfolks. Also Mr. Durgate, who has had South Downs six years, is clear that, free from all change in husbandry, or other circumstance that would unfairly affect the comparison, the number kept, compared with the Norfolks, has been as five to four. The carcase is as heavy as the Norfolks, more wool, and a better price. He does not fold; but the South Downs would bear it better than the Norfolks. At Palsgrave he folds the South Downs, because there is a sheep-walk; a Norfolk flock changing gradually to South Downs.

Some think that the South Down are much superior to the Norfolk, Cambridgeshire, and west country sheep, both in point of form, hardiness, fineness of wool, and disposition to fatten. Crosses of the South Down with other sorts are likewise much approved of in many places; as that of the South Down ram with the Norfolk ewe, the lambs of which cross are sometimes greatly admired. Some suppose it equally beneficial when done with several other breeds, according to the circumstances of the different districts. But this sort of crossing is very sparingly practised in the native district of this breed of sheep. It has been tried with Spanish rams, and the wool has been considerably improved by the attempt; but two great defects, not to be compensated by any improvement in the wool, are said to be produced, which are tenderness of constitution, and badness of shape. In other places this has not, however, been noticed to take place. In Oxfordshire, and several other counties, the South Down breed is fast supplanting the Berkshire, Norfolk, and many other kinds.

And it is stated, in the Staffordshire Agricultural Survey, that the Cannock Heath are a sort of sheep that has much resemblance to this breed, and is believed to have originated from the same. It is stated to have been much improved in the form, thickness, and weight of the carcase, as well as the fineness of the wool, by crossing with rams of the Herefordshire breed. They are polled with grey faces and legs; low before; wool fine and thickly set, weighing two or three pounds the fleece; the mutton good; they weigh from 15 lbs. to 20 lbs. the quarter. In sir Edward Littleton's improvement of this breed, by crossing with Herefordshire tups, the carcase and wool were both bettered, the latter being rendered worth nearly 2s. the pound.

The Norfolk Breed or Variety.—In this sort of sheep, the face is black; the horns large and spiral; the carcase long, small, weak, and thin; narrow chine; large bones; very long black or grey legs: mutton fine-grained and high-flavoured, but does not keep well in hot seasons. The weight per quarter from 16 lbs. to 20 lbs. The wool in the best part short and fine, but part coarse. This breed is chiefly prevalent in Norfolk and Suffolk, where folding is much the practice, as they have the property of travelling well. They are found in disposition to be given to be restless, which renders them unfit stock, except in good inclosures. And it is stated, in the nineteenth volume of the Annals of Agriculture, that this sort of sheep, from possessing few valuable properties, in addition to that of stand-

SHEEP.

ing the fold well, and as requiring much expence in winter keep, an acre of turnips being the usual allowance for half a dozen besides hay, has lately given way to the South Downs, which are supposed by some to be hardier, less nice in their food, sooner ready for the fold, and more quiet. This last sort has lately gained much ground. The wool might be improved by a Spanish cross, but little other advantage would be gained. It has been remarked, in respect to the quick *tainting* of this mutton, by Mr. Vyse, butcher of Eaton college, that the Norfolk mutton certainly will taint sooner than any other, in very hot weather; neither is there any sort (that he knows) of a worse flavour at that time, though inferior to none in cool weather. Many very fine and fat Norfolks do not please on the table. The fat runs away in roasting, if they are laid to a hot fire; and they rarely are so sweet as the South Downs. The latter are in hot weather worth a halfpenny a pound more than the Norfolks. When both are *completely* fattened, it is hard to say, (supposing the season cool,) which upon an average is fattest: the flavour too, in such a season, he thinks, is equal, and as to coarse meat, there is none in either sort. But if they are killed in cool weather, before they are very fat, the preference must be given to the Norfolks, because the meat will in that case eat better, and there is a probability of much more fat within. With respect to profit to the feeder, if they are fed entirely with grafs and upon good land, his opinion is decidedly in favour of the South Downs; or if they eat turnips in the winter, and after that are kept two or three months upon grafs in the spring, it is the same; but if they are half fat against winter, and are to be completed at turnips, he believes no sheep are more profitable than Norfolks, perhaps none so much so. But both sorts should be kept where there is both turnip and grafs land. There are varieties of this breed in Cambridge and Suffolk, with coarse wool, and weighing about 18 lbs. or 20 lbs. the quarter.

Crosses of the Norfolk, with the South Down and many breeds of other kinds, are met with and highly valued in different situations.

A great diversity of opinion prevails, in regard to the superiority of the Norfolk and the South Down, which has led an experienced sheep farmer, at Finchfield in Essex, to make the very accurate trial which is detailed below. In September 1791, he purchased in Suffolk a lot of ewe lambs, at 6*l.* 10*s.* the score: and in Suffex, in the October following, a lot of South Down ewe lambs, at 13*l.* the score. These lots of sheep were depastured together, and received in every respect the same treatment until the 25th of the same month in 1793; when a single sheep, which was adjudged to be the level of each lot, was taken out, and after both of them had fasted twenty-six hours, they were weighed alive, the South Down weighing 96 lbs. and the Norfolk 95 lbs: they were then killed, and the results of the trial were as follow.

	South Down.	Norfolk.
Carcase	52½ lbs.	53½ lbs.
Skin	8½	7 and horns.
Legs cut off at the knee-joints,	1½	1½
as usual		
Caul	4¾	3
Blood	4	5
Head and pluck	7½	7½
Gut fat	2¾	2¾
Entrails and contents	12½	14
Loss by killing, probably urine	2	1¾
	<hr/> 96	<hr/> 95

In favour of South Down.

2½ lbs of fat, 4½ <i>d.</i> per pound	<i>s.</i> <i>d.</i> 0 10
1¼ lb. of skin and wool	0 5
	<hr/> 1 3

In favour of Norfolk.

1 lb. of mutton	<i>s.</i> <i>d.</i> 0 5
1 stone cost	6 6
	<hr/> 6 11

Total difference in favour of Norfolk sheep 5*s.* 8*d.*

It is noticed, that neither of these ewes had any lambs, but at the time of trial, the Norfolk was more than half-gone with lamb, and the South Down had but just taken the ram.

In short, the leading and characteristic qualities of the high and full-bred Norfolk and South Down sheep, seem upon comparison to be chiefly these, the wool of both is found to be of the first clothing quality, but the larger quantity is produced by the South Down: the mutton of both is equally delicious. But the quiet gentle South Down in the pasture, must be opposed to the wild impatient ramblings of the Norfolk, whose constant exercise not only excites continual appetite, but at the same time occasions considerable waste in the pasture, by treading down and unnecessarily spoiling a great deal of food they do not eat. For this extraordinary exertion on the part of the Norfolk sheep in thus, as it were, wantonly destroying a large portion of food which is prepared for its subsistence, there does not appear, from the trial already noticed, to be the smallest occasion at least, to put it on an equal footing with the South Down in that particular; for it is evidently demonstrated by that trial, that in an equally sized sheep, the heaviest, and most capacious stomach, and consequently requiring the greatest quantity of food, is found to appertain to the Norfolk sheep. The hardiness of the South Down, enduring wet and cold lodging, and a greater degree of abstinence and fatigue than the Norfolk in the fold, is a superiority of much moment; and only to be equalled by another, which they possess in a very superior degree, which is that of doing well upon coarse four pastures. These are fairly to be contrasted with the delicate constitution, and the tender aromatic herbage, required by the Norfolk; to all which it may be added, that the South Down is an equally good turnip sheep; and for every possible purpose, whether for its flesh, for its wool, for breeding, for folding, or for the butcher, they demand a less supply of food, and of an inferior quality to that which, in every situation, would appear indispensable to the well doing of the Norfolk. On the score of the first cost of these sheep, an objection may, it is said, be very justly stated as to their general use; but when the South Down are more generally bred and increased through the country, in that proportion will the present objection be done away; and though they may continue in equal estimation, they will nevertheless, by their being more generally diffused and increased every where, be brought to a more equal level, in point of price, with the Norfolk, Welsh, and all those breeds so justly held in requisition for the fineness of their wool, and the superior excellence in the flavour of their mutton.

The value of the crosses which have been made between the Norfolk and Welsh sheep, by the South Down rams, are far from being decided, some sheep-farmers thinking them

SHEEP.

them highly beneficial, while others strongly reprobate them.

Delamere Forest Breed or Variety.—This is a breed or sort of sheep, which is found about the forest of that name, in the county of Chester. In point of shape, the animals are said not to be unlike those of a diminutive Norfolk sort, having the faces and legs black, grey, brown, and white, generally with small horns. The breed is small, the wethers not weighing more than from 8 lbs. to 12 lbs. the quarter, at four years old. The mutton is in common much esteemed, and the wool is valuable, selling about the year 1808 at 2*l.* 12*s.* 6*d.* the stone of 20 lbs; the fleeces are, however, small, often not weighing more than 2 lbs. The wool is commonly purchased by the manufacturers of cloth in Yorkshire.

The Herdwick Breed or Variety.—This is a breed which is characterized by Mr. Culley by having no horns, and the face and legs being speckled; the larger the portion of white, with fewer black spots, the purer the breed; legs fine, small, clean; the lambs well covered, when dropped; the weight *per* quarter, in the ewes, from 6 lbs. to 8 lbs.; in the wethers of four years and a half old, from 9 lbs. to 12 lbs.; the wool short, thick, and matted in the fleece. It is a breed peculiar to the elevated mountainous tract of country at the head of the river Eski, and Duddon in Cumberland, where they are let in herds, at an annual sum: whence the name. At present they are said to possess the property of being extremely hardy in constitution, and capable of supporting themselves on the rocky bare mountains, with the trifling support of a little hay in the winter season; scratching down to the heath, during the snows, for their subsistence; and by their constantly moving about, not being liable to be drifted over by snow. From the nature of the climate, the ewes produce their lambs late, and are generally kept as long as they produce lambs. But the wether stock is usually disposed of from the mountains, without being put in the pastures, at from four to five years old. It is observed, that the fleece in this breed is finer than that of the Heath sort, but coarser than any of the short-woolled breeds. It is a breed that stands in need of a cross with some of the finer-woolled breeds, and the Spanish has been suggested as proper for the purpose. The property of the flocks, as well as of the mountains, is in lord Muncafter, the lord of the soil; and the farmer of the principal flock is now Mr. Tyson, whose family, it is said, have inhabited this wild and sequestered spot, through four centuries. Mr. Tyson is a tup breeder, and sells a number of Herdwick tups yearly, some at several guineas each, to the adjoining districts, where their known hardy qualities are desirable.

The Cheviot Breed or Variety.—This breed of sheep is known by the want of horns; by the face and legs being mostly white, and the eyes lively and prominent; the belly long; little depth in the breast; narrow there and on the chine; clean, fine, small-boned legs, and thin pelts; the weight *per* quarter, when fat, from 12 lbs. to 18 lbs.; the wool partly fine, and partly coarse. Mr. Culley considers this as a valuable breed of mountain sheep, where the herbage is chiefly of the natural grass kind, which is the case in the situations where these are found the most prevalent, and from which they have obtained their name. It is a breed which has undergone much improvement within these few years, in respect to its form and other qualities, and has been lately introduced into the most northern districts; and from its hardiness, its affording a portion of fine wool, and being quick in fattening, it is likely to answer well in such situations. The Spanish and South Down have been advised as proper crosses for this sort of sheep.

And it is observed by the writer of the Argyleshire Report, that the Cheviot sheep are in every respect superior to the black-faced kind, and found to be equally fit for a mountainous situation. They are hardy, fine-woolled, and well-shaped. They are long-bodied and long-limbed, which fits them for climbing steep mountains, and for travelling, either for seeking their food, or going to a distant market. Their fleece, too, is finer, closer, and warmer. They have every property that should be sought in a mountain sheep, and accordingly they have been found to thrive in every part of the Highlands in which they have been tried, and are said to be less subject to diseases than the black-faced kind. Some of them have been lately introduced into the county by the duke of Argyle, and by Mr. Campbell of Auch, in the highest parts of Glenurchay, and found to answer exceedingly well. And lord Breadalbane, a few years ago, made a present of some Cheviot wedders to several of his tenants in Glenurchay, in order to try how they would fare on the same pasture with the black-faced kind; and the writer was informed by some of the store-masters, that they perceived no difference in their thriving. Indeed no part of this county is more inclement than that from which they came, where the hills are sometimes covered with snow for three or four months in a year, and where many of the lower walks consist of peat-bogs and deep morasses; so that with us their situation would be mended, a circumstance which will always ensure success.

It is likewise stated in the twelfth volume of the Statistical Account of Scotland, that the following experiment, made in the parish of Barr, in Ayrshire, shews the comparative hardiness and value of the Cheviot breed. In June, 1792, a ram and two score of ewe hogs, of the Cheviot breed, were put upon one of the highest and coldest farms in the parish. The harvest was wet, the winter and spring stormy, and the loss of the native sheep, through poverty and disease, was considerable; yet all these, though strangers, and in such a situation, did well. The wool of the native sheep, taking ten fleeces to the stone (24 lbs.), sold at 7*s.* 6*d.*; the wool of the Cheviot kind, taking only seven and a half to the stone, sold at 15*s.* The profit here was great; but how much more, if the wool had fetched its real value of 20*s.* the stone! And in "The Observations on different Breeds of Sheep," it is stated that in 1792, the Cheviot wool sold from 18*s.* to 20*s.* the smeared, and from 20*s.* to 22*s.* the white; from six to eight fleeces of the first, and from eight to nine of the last, going to the stone. Some went as high as 23*s.*; and it is thought it will soon be improved so as to fetch 30*s.*, if not 40*s.* Draft ewes sold from 12*s.* to 16*s.*, and three-years old wedders from 18*s.* to 22*s.* In Etterick, Eweisdale, and Liddefdale, they are now converting their flocks as quickly as possible into the Cheviot breed. The Roxburgh Agricultural Report also says, that Liddefdale is the worst district, yet the Cheviot breed thrive in it. The writer of the first of these Reports remarks, that it is difficult for those who have already got another kind to change the breed; but new beginners ought undoubtedly to stock with the Cheviot kind. It is said that the Yorkshire graziers have a prejudice against this kind; probably because they would then have more rivals in the trade, which is now in few hands; as the carcase, and not the wool, is the principal object of attention. Whatever there may be in this, the introduction of the Cheviot, which would treble the price of wool, would more than balance it. And he adds, from the same volume of the Statistical Account of Scotland, that even they who have another stock, and cannot conveniently change it, might at least cross it with the Cheviot breed, which might

SHEEP.

be done with little trouble, and to great advantage. In the years 1787, 1788, and 1789, an intelligent farmer, in the parish of Moffat, put Cheviot rams to his black-faced ewes. In 1790 he sold the wool of the sheep produced by that cross at 10s. the six fleeces; and the wool of his other flock of the black-faced kind, which went exactly on the same pasture, only at 6s. 3d. the seven fleeces. The sheep thus produced were as healthy as his other sheep, the carcass not materially altered, and the weight of the wool increased a seventh part, and its price more than a third. The farm on which they were is as high ground as almost any in Scotland.

And the sheep which are at present known by the title of *Long Hill sheep*, by the northern farmers, are a hornless, white-faced, loose-shaped breed, having a coat of ordinary short or fine wool, perhaps raised by crossing, through time, the old country breed with those of the Cheviot kind. They are said to be more tender than the short or black-faced breed, but to answer well with good care and keep. However, from the practice of milking ewes of this breed, for the purpose of making cheese, being found to be prejudicial, it has lately been much left off by the best sheep-farmers in these districts.

The Dun-faced Breed or Variety.—This is a sort which Culley says has no horns; the face in common of a dun tawny colour; the size small; the tail short; the mutton fine in texture; the weight often only 6 lbs. or 7 lbs. the quarter; the wool variously streaked and blended with different colours, some of which is very fine. He supposes it to partake of the Spanish breed, but it is not so hardy as the Cheviot breed. The mutton of this breed is excellent in flavour. They are supposed by some to have had a Spanish origin; but they have been naturalized, for a great length of time, on the Grampian and other hilly districts in Scotland.

The Shetland Breed or Variety.—This is a small breed, and mostly without horns; but what more particularly distinguishes it from other breeds, is the uncommon smallness and shortness of the tail; the weight per quarter from 7 lbs. to 10 lbs.; the wool very fine, and of various colours. The breed is very hardy, but much too wild in its disposition to be confined in inclosed pastures, and of course less proper for the purposes of the grazier. There is a sort of this breed of sheep, which, according to Mr. Johnson, carries coarse wool above, and fine soft wool underneath; and the sheep have three different successions of wool annually, two of which resemble long hairs rather than wool, and are by the common people termed *fors* and *scudda*. As soon as the wool begins to loosen at the roots, which is mostly about February, the hairs or *scudda* spring up; and when the wool is cautiously pulled off, the tough hairs continue fast, until the new wool grows up about a quarter of an inch in length, then they gradually wear off; and when the new fleece has acquired two months' growth, or thereabouts, the rough hairs, termed *fors*, spring up and keep root, until the proper season for pulling it arrives, when it is plucked off along with the wool, and is separated from it, at the time of dressing the fleece, by an operation called *forfing*. The *scudda* remains upon the skin, as if it were a thick coat, a protection against the inclemency of the season. But the native or kindly breed, that bear the soft cottony fleeces, according to Mr. Culley, are rather delicate; though the fact of their eating the sea-weed greedily, when the ground is covered with snow, and often during long and severe snows, when they have little else to live on, seems to prove the contrary. Nature, he says, seems to have imparted to them a perfect knowledge of the times at

which this food may be procured; for immediately upon the tide beginning to fall, they in one body run directly down to the sea-shores, although feeding on hills several miles distant from the sea, where they remain until the tide returns, and obliges them to seek their usual haunts. They are very hardy, and the wildest of all the breeds of these animals.

But in respect to the wool of these *beaver* sheep, as they are sometimes termed, it is short and open, and destitute of a covering of long hairs. These fine soft fleeces are liable to be rubbed off during winter, or early spring, which, it is supposed, might be prevented, by clipping the sheep in the usual way, instead of the absurd mode of pulling them off, which tends to weaken the sheep, and decrease the length of the staple of the wool. In regard to colour this wool is various, as *silver grey*, which is the finest and softest; the pure *white*, which is mostly of the greatest value for all the purposes of the finest combing wool; the *black*, and the *mourat* or *brown*, which are very little inferior: the whole of the softest texture, fit for the finest manufactures, and in some instances rivalling even Spanish wool, than which it is somewhat longer in the staple, and not so elastic. And it is stated to have been manufactured into stockings of extraordinary fineness; and that the fleece attached to the skin affords a fur of great value. This breed was formerly a native of the higher parts of Aberdeenshire, and in the districts to the northward of it; but it has been since much crossed, and it is now mostly confined to the Orkney and Shetland isles, the purest breed being to be found in the latter. The number of the *beaver* sheep in these isles amounted to ninety thousand, some years since; and five or six of them are said to be capable of being fed with the food required for one English sheep. In the West Riding of Yorkshire, Mr. Beaumont is said to have made a trial of these sheep; the result of which was, that they did not fat, but grow, which shews that their size would improve with that of the soil: their wool also improved in length. But the original old breed of the Highlands are said to partake of the nature of the goat and deer; their coat consisting of a sort of fur or down, covered by long, straight, rigid hairs, like those of the beaver, rather than wool; tail short, slender, tapering, not larger than that of the deer or goat, and thinly covered with strong, silvery hairs; the face covered with sleek hairs, like the face of the deer, with his prominent eyes. They are tame, delicate of frame, and requiring to be housed in winter: their flesh of high venison flavour. The breed is found in its original purity, in the central Highlands, on the southern banks of Strath Tay, and between those and Strath Brand; and on the banks of Loch Ness, in the northern Highlands, as well as in the Shetland islands.

The Merino or Spanish Breed or Variety.—In this breed of sheep the males have horns, but the females are without them. They have, according to lord Somerville, white faces and legs; the body not very perfect in shape; rather long in the legs; fine in the bone; a degree of throatiness, or production of loose pendulous skin under the neck; and the pelt fine and clear; weight, when tolerably fat, per quarter, in the rams about 17 lbs., in the ewes 11 lbs.; the wool very fine. It is a breed that is asserted by some to be tolerably hardy, and to possess a disposition to fatten readily; but others maintain the contrary opinion.

His majesty took the lead in the introduction of the Merino breed into this country, and his first flock was imported in 1792; but other nations seem to have got the start in this respect, as Sweden had them even in 1723, where they have since greatly increased; and in France, Germany, and some other

SHEEP.

other states, they were probably known long before. They have lately spread much in this country, and been greatly improved in different respects, by judicious crossing with other sorts. The horns in the true Merino rams are now of a middle size; the faces and legs darkish-white, the latter rather inclined to be too long. The wool is uncommonly fine, and weighs about $3\frac{1}{2}$ lbs. to the fleece, not being liable to deteriorate in this climate. The fleeces have a dark brown tinge in their surfaces, formed by dust sticking on the greasy yolk property of its pile; the contrast between which and the rich white coloured wethers, and the rosy hue of the skin, is very striking on the first view.

Some crosses the Merino rams with Devonshire ewes, but the Ryelands are more commonly preferred. They consider five crosses as necessary for reaching perfection; and on that ground properly conclude, that the wool of the first cross can only reasonably be supposed to be worth about 7d. the pound more than that of the maternal flock, on the idea that it will, in five crosses, be of the value of 3s. above that of the Ryeland ewe; making an improvement of about 7d. in each cross. And that if the wool, when this sort is mixed with the most valued native breeds, does not gain its necessary degree of fineness in less than five crosses, it is unreasonable to expect the full price for it at one cross. It is, however, certain that the animal is improved by a mixture with the Ryelands, and that the wool will not ultimately be found inferior to that of the Spanish flock. The Spanish crosses with the South Down and Ryeland, in several degrees, is diffusing itself in many districts with great benefit. With the latter, in Devonshire, the wether produce, at two years old, weigh 15 lbs. the quarter, and afford a fleece of 5 lbs. each, worth 3s. the pound. In other cases, the weight of mutton is greater in the first cross; and the shear of wool from $6\frac{1}{2}$ lbs. to 7 lbs. in the year to the fleece, at the same age. Crosses with some other fine-woolled breeds are likewise made with great utility.

But according to Dr. Parry, who has had great experience of this breed, they are, as stated in a late work on Live-stock, entirely enveloped in wool, which grows under the jaws, down the forehead to the eyes, under the belly, and down the legs to the very feet. It is astonishing to see how thickly it covers the skin; it will scarcely give way to the pressure of the hand, but yields as it were by starts, like the close short hair of an extremely fine clothes-brush. In washing them, the water penetrates to the skin with great difficulty. The fleece is heavier, in proportion to the carcase, than that of any other known breed in Europe. In the raw state (unwashed on the sheep's back or afterwards), the fleeces of the two-years old ewes average at $4\frac{1}{2}$ lbs. avoirdupois, and the weight of the living ewe being about 60 lbs. the proportion of wool to that of carcase is about 1 lb. to $12\frac{1}{2}$ lbs. The fleece of a fat wedder of the same age will be from 5 lbs. to 7 lbs. In eight shearling rams, weighed alive, after having been clipped, the weight of the fleece to that of the living animal, was as one to about twelve and three quarters. The wool from the head and behind the ears, and the rest of the refuse, generally called *daglocks*, had been previously taken away. It is added, that had these sheep been washed before shearing, their fleeces would have lost about a ninth part. And that the length of the staple or filaments varies. In a shearling ram, shorn when a lamb, a sample of the wool cut close to the skin above the shoulder, was three inches and a half in length; and that of the breech, or middle of the back part of the thigh, three inches and three quarters: of an ewe of the same age, about a quarter of an inch shorter: the average according very exactly with

the specimens taken from newly imported Spanish sheep. An instance of the extraordinary length of staple, of four inches and three quarters, is related, which from the scoured fleece produced a sample more than five inches long. The proportion of fine wool in the fleeces of the Spanish sheep is much greater than those of any pure English breed. Thus, while in the Ryeland, which is probably divided into four or five sorts, the finest wool from the neck and shoulders does not make above one-eighth part of the whole fleece: in that of his majesty's flock, the fine wool formed near four-fifths of the whole. It is farther observed, that of Dr. Parry's wool, consisting of whole fleeces taken from sheep which had not more than three or four crosses of the Spaniard, and divided into three sorts (R. F. T.), according to the Spanish method, 155 $\frac{1}{2}$ lbs. produced of R. or Rafinos, or superfine, 104 lbs. more than two-thirds of the whole. And the uniformity of fineness in the improved wool is such, that in shewing specimens from these different parts of the same animal, (the shoulder and the breech,) which are generally considered as producing the best and the worst wool; the doctor never met with any three persons who could agree which was the finest, and many good judges actually decided in favour of the latter. This wool contains a great deal of yolk, or oil, which is apt to entangle the dust of the fields, so as often to form a kind of mat of nearly an inch in thickness; it is remarkably, or rather wholly free from fitchel hairs or kemps. Brownness in the wool of any particular sheep is an indication of superior fineness (and such was the colour of the ancient fine-woolled sheep, and we need not look for the cause in any peculiar quality of soil or composition mixed with the wool); it will nevertheless scour white. But according to lord Somerville, this dark-brown tinge on the surface of the best fleeces amounts almost to a black, which is formed by dust adhering to the greasy yolk properties of its pile; and the contrast between it and the rich white colour within, as well as that rosy hue of the skin, peculiarly denoting high proof, surprize at first sight. The harder the fleece is, and the more it resists any outward pressure of the hand, the more close and fine will be the wool. Here and there a fine pile may be formed with an open fleece, though but rarely. And in Mr. Tollet's Spanish flock, purchased from lord Somerville, the average weight of each Spanish fleece in the grease was 5 lbs. 13 oz., and the lightest ewe fleece 3 lbs. 4 oz., and the heaviest ram fleece 11 lbs. 12 oz. of very good quality. This ram was not quite thirteen months old at shear-day, and was adjudged to weigh 20 lbs. *per* quarter. Mr. Tollet declined the price of two hundred guineas for him, likewise that of one hundred for the use of him during the tuppung season: he does not wash his Merino sheep before shearing, since, from the closeness of the fleece, it is not much liable to the intrusion of dirt: as it does not lose quite half its weight in scouring by the manufacturer, an estimate may be made after that rate of the value of the fleece in the yolk. The fleece of the young ram produced upwards of 35s. and the average produce of the whole unwashed Merino wool 18s. 9d. each fleece. The price of the superfine more than four-fifths of the whole, 6s. 3d. and 6s. *per* pound of the third sort, or *fribs*, which was but about one pound in the whole quantity. Mr. Bartley has somewhere mentioned, that four wethers of this breed produced the quantity of 35 $\frac{3}{4}$ lbs. of wool; and of several ewes which produced 8 lbs. each, and of a wether which gave 10 $\frac{1}{2}$ lbs.

In the introduction of this breed his majesty, as has been seen, has taken the lead, and from his flock a great number of the improvers of it have been supplied in the different

SHEEP.

ferent sales that have been made since its first establishment. In the sale of 1803, in Kew Lane, under the direction of Sir Joseph Banks, the numbers sold, according to some, were twenty-four shearling rams, which produced the sum of 402*l.* 9*s.*; seven full-mouthed and four toothed rams, 171*l.* 13*s.* 6*d.*; fourteen ewes, 118*l.* 8*s.*; amounting in all for the forty-five sheep to 692*l.* 10*s.* 6*d.* The highest price of the shearling was 42 guineas, the lowest 6*l.* 7*s.* Of the full-mouthed rams, 28 guineas were the highest, and 7½ the lowest price. Of the ewes, 11 guineas the highest, 6 the lowest. The rams were put up at six guineas, the ewes at two guineas; the former prices at which they were allowed.

The wool has been sold this year uncoursed at 4*s.* 6*d.* per pound. The size of the ewes somewhat under our pure Ryelands, but above several of our small breeds; heads sharp and well-shaped, with occasionally a black spot or two; wool externally having a dirty tinge, but without that red-brown hue which has been before mentioned; ears pendulous; perfect ewe-neck, with the sinking or cavity both before and behind the shoulder, the top of which is generally higher than the rump; capacious belly, the animal standing wide and well upon the legs; the rams generally of good size, some of them large enough for any purpose whatever, and of a great bone, but flat and symmetrical; several of them were of as good and useful form as need be seen, having compact loins and shoulders, and straight backs. Two or three individuals resembled very strikingly our Dorset and Hampshire stock; the characteristic velvet or filken gloss on the shorn faces of the rams was remarkable, and their countenance put one in mind of the fair-haired human complexion. Mouths by no means fine

And it has been observed, that the large tuft of wool covering the face of Merino sheep is extremely inconvenient in northern countries, where they have frequent heavy drifts of snow. And that it is Lord Somerville's practice to clip this and the leg-wool two or three times a-year, beginning about six weeks after shearing. But that in winter, and in very rigorous climates, it may not be proper to leave the head too bare and exposed, as it may produce disease. These clippings may be proper for inferior purposes, and the fleece be rendered more pure and valuable without them. The tuft on the head, and even the *throatings*, or protuberance in the throat, characteristic of the Spanish sort, are, as it is asserted, discoverable, in degrees, in some of the native breeds, particularly the Ryeland, shewing its origin. And a good judge, Mr. Knight, contends, that the produce of a cross with this breed, and the *Archenfield* or true Ryeland sort, is extremely ugly, and, according to his information, subject to the foot-rot. On some rich pastures in Middlesex this has also been found to be the case in both the true and crossed breed.

The Mugged Breed or Variety.—This is a singular breed of sheep, which formerly prevailed throughout all the low lands of Northumberland. They had a short, coarse, curled wool, covering their heads, faces, and legs, and grew down to their feet; in form they resembled hill sheep; their shoulders low and sharp; sides flat; back rather arched; loins thin. It has been suggested, that this mugged appearance may have been the result of a Spanish cross. This sort of sheep has extended to Yorkshire; and traces of them are still visible, although they have long since given place to sheep of the long-woolled kinds. They are now chiefly met with in the northern counties.

The Welsh Sheep or Variety.—These, which are the most general breed in the hill districts, are small-horned, and all

over of a white colour. They are neat compact sheep. There is likewise a polled short-woolled sort of sheep in these parts of the country, which are esteemed by some. And the genuine Welsh mutton, from its smallness and delicate flavour, is commonly well-known, highly esteemed, and sold at a high price. But the fattening of the small Welsh sheep has not in general been found to answer in the southern districts of the kingdom. In short, this is a breed which stands in need of much improvement, and which is capable of admitting of it with much advantage to the sheep-farmers of that district.

The crosses of it should be with the larger finer woolled breeds, that afford good mutton, and be made with great care and attention. It is supposed by some, that the Welsh are the original of all the different breeds of sheep in the island.

The Irish Breed or Variety.—This is a breed of sheep, which is described in this way by Culley. These sheep are supported by very long, thick, crooked, grey legs; their heads long and ugly, with large flapping ears, grey faces, and eyes sunk; necks long, and set on below the shoulders; breasts narrow and short, hollow before and behind the shoulders; flat-sided, with high, narrow, herring-backs; hind-quarters drooping, and tail set low. In short, they are almost in every respect contrary to what he apprehends a well-formed sheep should be. The spirit of improvement in sheep-stock has however extended itself to Ireland, and there can be no doubt, therefore, but that they will soon improve this as well as other sorts of live-stock.

Indeed, since the period in which the above account of Irish sheep was given, many useful and important alterations and improvements have been produced by judicious selection and crossing in this sort of stock, in several different parts of that country.

However, independent of these numerous breeds or varieties of sheep, which are inhabitants of this island, there are in other countries many other kinds, which may be just noticed for the sake of curiosity, as they are occasionally seen in parks and pleasure-grounds in this intention. The more cold districts of Iceland and Russia afford a *many-horned breed* of sheep, mostly from four to seven or eight; having a coat of dark-brown coloured hairy wool, weighing about four pounds, and covering an interior one of short soft fur. Also in Russian Tartary, a large *lop-eared*, *polled* aquiline-nosed breed of sheep, somewhat resembling the Wiltshire and Dorset breeds in their shape, are produced, and which have a long thick wool, of a black and white mixed or roan colour, and in the place of a tail, a large cushion of fat occupying the rump; hence some naturalists have called them *fat-rumped* sheep. This and the broad-tailed breed are sometimes called the Kalmuc and Altrachan breeds. The projection of fat, in this, has an exquisite delicate marrowy taste. Some say the wool is rather short, not coarse, but having hair growing through it. They are said to be so prolific as to bring two or three young at once. And in Walachia, Crete, and through most of the Archipelago islands, there is a breed of sheep which have singular horns, twisted in a spiral or screw-like manner, standing in a perpendicular or diverging extending manner from the fore-part of the head, to some height. In size and shape tolerable, bearing a long shaggy but not coarse coat. Likewise in the extended districts of Persia, Syria, Egypt, and Barbary, the *broad-tailed* sheep are met with, the tail in some of which grows to the breadth of a foot, and to a length to bring them to the weight of from twenty to fifty pounds, on which account the shepherds are sometimes under the necessity of supporting

SHEEP.

ing them on a carriage to prevent them from galling and exhausting the animal. These appendages are mostly also esteemed a great delicacy, being of a nature between fat and marrow. Further, some of this breed of sheep, especially those of the mountainous sorts, have a wool of extraordinary length and fineness, from which are made the expensive Indian shawls, and some other fabrics.

And the Guinea breed of sheep, said to be common in tropical climates, is large, strong, and swift, and though domesticated, are often found in a wild state; having coarse, hairy coats, short horns, pendulous ears, and a sort of dewlap under the chin.

What is called the *Madagascar breed of sheep*, is also of a good size, and well covered with a close pile of smooth glossy hair in the place of wool.

The *Buckbarian breed of sheep* is also hairy, and kept in large flocks in Great Tartary. The island of Antigua has likewise a breed of the same kind. Sheep of this sort were imported from Spain by sir Joseph Banks, with coats as sleek and smooth as those of a horse, and which never at any season exhibited the least appearance of wool or down, or any thing of a similar kind.

It may be noticed, that it has been well stated in a late practical work, that in the breeds of sheep there are evident differences in their sizes, forms, flesh, wool, and other properties, that admirably adapt them for different sorts of pastures, situations, and uses of the farmer. And that the large long-woolled breeds, from their being more slow, heavy, and tame in their dispositions than most other kinds, are in general the most proper for the rich inclosed pasture districts: the breeds which possess greater length in the legs, more activity in walking, and a less burthen of wool, are suited to the more elevated lands, such as the downs, moors, and heaths in different parts of the island, where the pasturage is less fertile and luxuriant; and that the small light carcassed hardy breeds are most adapted to the exposed mountainous situations, where the food is more sparing, and obtained with greater difficulty and expence. And in the Rural Economy of the Midland Counties, it has been observed that a very long-woolled breed of sheep, as the old Lincolnshire or Teeswater sort, is necessary also in the view of our finest worsted manufactures; and another, such as that of the *new Leicester*, for the inferior kind of grasslands, and the rich inclosed arable lands, where the folding system is not in use; for the supplying the materials of the coarser sorts of worsteds, stockings, baize, coarse cloths, blankets, carpets, and other articles of the same kind; while a middle-woolled breed, as the Wiltshire, the Norfolk, or the South Down, is wanted for the well-soiled arable lands, where the practice of the fold is in use, in the view of making cloths of the narrow medium kinds; a very fine-woolled breed, as the Herefordshire Ryeland, for the finest cloths; and the Shropshire, or some of the more hardy breeds, for the heathy mountainous situations. The Spanish and Cheviot sorts may also be proper in the last intentions. What is therefore chiefly necessary to be regarded in the introducing of new breeds of sheep, is to consider with attention the nature and situation of the pastures on which they are to be supported, and to carefully avoid making use of larger or finer breeds than can be properly sustained; as upon due management in this respect, much of the success in the improvement of sheep-stock must necessarily depend. Where bettering the form of the animal, and improving the quality of the wool or coat, are the principal objects, they may be effected by judicious crossing with proper breeds for the particular purpose, on the principles that

have been explained in speaking of the nature of breeding, and which is farther shewn below. (See BREED, BREEDING, and LIVE-Stock.) Indeed this last circumstance is one which should particularly engage the notice of the farmer in the business of stocking his lands with sheep, as it seems from numerous statements, that wool of the finest quality may be produced in this country by means of Spanish sheep, and their being properly crossed with our fine-woolled breeds, which is a matter of the greatest national importance, as affording a probable means of rendering us independent of the foreign supply of this expensive but indispensable article. The breeding sheep-farmer should therefore be particularly interested in promoting this sort of improvement, in all situations where the nature of his land will admit of it, which lord Somerville has shewn may be the case in most instances where the short-woolled breeds of sheep can be properly kept, or probably on more than one-half of the pasture-lands of the island. And he has remarked that there is one inducement to this, which is that of its not interfering with the production of the most valuable sort of mutton, a point to which the sheep-breeders of this country have till lately been particularly attentive, almost without regarding the quality of the wool: as it has been found that the quality of the flesh in the different divisions of sheep inclines to the nature of the wool, the short-woolled sheep being close in the grain of their flesh, of course heavy in the scale, and in the taste high-flavoured; while the polled long-woolled sort are more open and loose in this respect, larger in size, and the mutton more coarse, and in general less saleable in the different markets in the kingdom.

In sheep there are certain good or bad qualities, properties, or dispositions which mark their value and importance in the view of the farmer, grazier, and breeder. That such certain peculiar properties and dispositions prevail, is well known to experienced persons of these descriptions, by sheep in exactly similar circumstances in every respect becoming more or less quickly in the state of fatness, &c.; as an improved disposition in them signifies an aptitude to convert their food or nourishment into flesh and fat. Thus, in a number of sheep of the same kind and age, under the very same management, when handled, a vast difference will be found in their condition and state of fatness, &c. Some will be in a state to go off many months before the others are ready, although put on the same land in equal flesh; and others, though kept far beyond the usual period of time, will never get into sufficient condition. The disposition of the former must, of course, be very beneficial and desirable to such sheep-farmers, as well as advantageous to the community, while that of the latter is quite the reverse. This is likewise the case in the breeding of ewes, as those which have it most are in the best state at the lambing time. But there are, it is supposed, some instances of exception in this and other descriptions of sheep, which possess good qualities, that have bad properties, which such sheep improvers as the above should also be careful in detecting, otherwise they may be liable to sustain considerable injury and loss: and it is frequently seen on killing different kinds of sheep, that there is great difference in individuals of the same breed and variety.

There are several circumstances which are supposed to form or contribute to this goodness of disposition in these animals; they must be well bred, or come from such as have good properties; they must not be permitted ever to be in a state of want of food, or be reduced in flesh; they must have constantly good food in sufficient abundance, the richer, to some extent, the better; they must have their

SHEEP.

frame or bone not too large for the quality of their keep; they must have a due relative proportion of parts; they must handle free and mellow in their flesh; they must have a peculiar appearance of countenance; and they must be perfectly tame and quiet. There are also other causes which in some measure conduce to this end, but they are of less certainty in their operation, such as the state and action of the blood in their systems, &c. The external forms and qualities of sheep which shew a good disposition are, a smallness of the head, a thinness and shortness of the neck, a deep wide breast, a wideness over the shoulders, a broad, straight and deep carcase or barrel, a smallness of bone and feet, the joints moderately short, the muscles or flesh plump and full, with a thinness about the insertion: the skin middlingly thin and mellow, of a fine texture, and a clear red and white colour; the wool of a yellowish-white appearance, a curly nature, and neither too long nor too short, but thickly set, the fat and flesh soft, with some sort of firmness in handling, and the countenance pleasant, and inclined to quietness.

The improved disposition or quality of sheep is promoted by taking them from poorer or inferior keep or soils, to such as are of a better and more rich kind, as in the case of seeds: but the removing of them from rich soils or keep, to such as are of a worse nature, has directly the contrary effect. The quality of the flesh, in one case, becomes soft and mellow, while in the other it gets more close and hard.

The nature and quality of the land or soil, when any breed of sheep are kept upon it for a length of time, will, it is believed, throw out the suitable size for it, and certain accidental qualities will occur according to its sort, which, when properly managed by the breeder, will afford an improved disposition in the animals. In such a case improvements may have a probability of being produced, by having the male smaller in size than the female, and by changing him from too good or rich keep, so that his constitution may be in some measure delicate, by the female having her nourishment regular, and so as at no time to be lowered in flesh; and when a more full supply of food may be wanted, by the increase being moderate, so as to preserve rich keep for the young, in its advancing growth; by breeding from such sheep as are the most kindly, shew the best disposition, and allow the fullest profit, on the particular soil or land on which they are bred and pastured; by choosing and selecting the middle-sized sheep of the flock to breed from, and not the largest, as it is favourable to be rather under than over the quality of the soil or land for forming good disposition; by refraining to breed from sheep displaying a bad disposition, or which have defects; and by cautiously using for this purpose ewes which have had lambs, and are not too old, as disposition is supposed more likely to be produced from the second than the first lamb: and lastly, by the mode of breeding that is called *in* and *in*, or in the same line, which greatly contributes to form disposition.

In the degenerated form of sheep, the reverse of all this will, of course, mostly take place; they will have these qualities or properties in a larger or smaller degree; their heads will be generally short and thick, though occasionally rather long, and of a coarse nature; the neck, for the most part, long, thick, and concave in the higher part; the carcase long and thin, and the ribs flat, usually termed "flat-sided," while in improved sheep they bow out almost at right angles with the spine, in somewhat the barrel manner. Narrow shoulders, the loin not wide, the back not straight, and the belly gutty; the breast or chest contracted, without being deeply let down; the legs long, and thigh

not full or fleshy; the flesh thin, of a close texture, and thick about the insertion of the muscular parts; the feet large and coarse; the flesh hard in handling, or what is sometimes denominated "sticky;" the countenance far from pleasant, and the nature wild; the wool coarse and hempy; but capable of improvement by attention; difficult, or requiring time in fattening; the mutton often of good quality for eating, of a firm grain, sweet flavour, and abounding in gravy.

Sheep of this kind in general require a much greater quantity of food for their growth and support, and for fattening, than the improved sort, which is a circumstance that must evidently be disadvantageous to the breeder, grazier, and the whole community,

All such persons as are in the habit of breeding and fattening sheep, and have sufficient experience, find that they depend on the qualities or properties of their breeds for growth and improvement: some will not fatten at all, or be as long again in fattening as others, and this most commonly occurs in such as are not of the individual's own particular breed or kind. The degeneracy of sheep is readily seen and easily proved in the management of them. And some consider almost the whole of the breeds or varieties of this country to be more or less in this state, or that there is not probably more than one which can be said to be truly in an improved condition, on the exact principles of improved forms.

This degeneracy is in a great measure the consequence of neglect or error in the breeders and managers of sheep, as when they thrive and fatten well, that is to be attributed to proper selection, suitable keep, and a due regard to the true and exact principles of management: but when, on the contrary, they do not go on to fatten well, but decline into a state of degeneracy, it proceeds from neglect, starvation, and the want of such true principles in their regulation and management. As though a lamb may possess good proportions, yet from neglect and other causes, it may be reduced to a state of poverty; which, when it takes place, its degeneracy may be dated from that period, as its constitution is injured, and an unfavourable action is given to the system. The longer it is kept in this state, and the more frequent the changes it may undergo, the more conspicuous will its degeneracy be. Nature, then, it is supposed, will throw out indications in conformity to this decline; the head will increase in size in a greater proportion than the other parts. The body will become thin and long; the bones will be irregular in their growth; and there will be a want of symmetry in the whole system. The causes which are the foundation of such degeneracy are believed to be these; the rams being too large in size, and kept in too high a manner; these and the ewes not being well adapted to the soil, but too large; the lambs being kept in an occasional state of want or starvation; the neglect in not breeding a proper number for the purpose of selection; the ignorance of breeders in regard to the true principles, in respect to the forms of sheep or their management; the frequent crossings of varieties of the same breed; the presence of dry summers and hard winters, which tend to incline the constitution to an unfavourable action, and consequent degeneracy; and the want of good water, which is very prejudicial to sheep.

It is suggested, that it is to be lamented, that almost all the breeds, in every situation, are found to have one or other of the bad properties or qualities already noticed. However, of all sheep, the shape or form of that of the Indian sort is probably the worst which is produced; and the Wiltshire, the Welsh, and many other breeds, are not without partaking of too many of the properties and imperfections of the same kind, in addition

SHEEP.

to their other defects. It is to be hoped, however, that a more active exertion, and investigation of the matter, in sheep-farmers, will in a short time be productive of the requisite improvement in this sort of live-stock, and that by having recourse to superior modes of breeding, rearing, and management, an equal pace will be kept in their advancement with that of any other branch of the farmer's art.

It may be noticed, notwithstanding what has been already said, that it is stated to be almost universally and unanimously the practice of the breeders on the South Down hills, to exchange the rams every third, fourth, or fifth year, as it is conceived essentially necessary to the preservation of the health, the size, and the bone of the flocks, though quite contrary to the maxims laid down by some eminent sheep-farmers, who are strenuous promoters of the method of breeding *in and in*, or in the same line, continually, when there is a good breed or sort of sheep. Flocks that are stated to have been nearly ruined in constitution and habit by this means, are said to have had a wonderful improvement by the change of the rams. See BREEDING.

The question concerning the best and most profitable size of sheep for the purpose of the grazing farmer, and for producing the largest acreable quantity of food and other products for the use of the community, is a matter of very great interest and importance. Though it cannot probably be disputed but that different sized animals of this sort must be had recourse to for different situations, sorts, and qualities of land, &c. yet the considerate sheep-farmer will, perhaps, mostly perceive the propriety of having his ground stocked with not too large a sort of sheep. It will most likely be the best way for such farmers to fully consult the nature and properties of the soils of their pasture or other lands, previously to their fixing upon the size of their sheep-stock which will be the most suitable and advantageous for them, as where their pasture or other grounds are inferior in their nature and richness, the size, of the live-stock of this sort, which is admitted, cannot with propriety be so large as in the contrary circumstances, even where light stocking is practised, for hard and pinching seasons will reduce the flock to the quality of the land. Though many are advocates for very large-sized sheep, probably from want of sufficiently considering the nature of the subject, it is never found that those who stock with such sized animals, ever produce so much mutton on the acre, or gain so great a profit on it, as those who make use of a middling-sized flock. Some indeed think that four small-sized sheep may be kept on the same extent of land which is required for three large ones; and that in some cases, allowing the sheep to be equal in disposition, the same number of small ones, of about nine stone each, may be fattened on the land that will barely be sufficient to feed three of from ten to eleven stones. Small-sized sheep-stock have also many other advantages attending them. Many make complaints against sheep with improved forms, such as the new Leicester, as being too small, from the mistaken idea of their close form, as although they may be short and compact, there is a greater width and depth of carcass in them; by which they do not come much, if any thing, short of the weight of the more apparently large breeds.

It is unquestionably a great error and defect in the sheep-grazing practice to choose sheep of too-large a size for the constitution of the soil, and the quality of the keep which it affords. The nature of keep will indeed itself be the cause of different sizes in sheep-stock, if they be steadily maintained on the same sort of land for some length of time, and this in some measure has produced the differences of size in the different breeds of this animal.

The particular advantages of the different sizes of sheep

may be summed up somewhat in this way. Those of the large sort are supposed capable of being kept in equal proportion, on the same quantity of land, and of bringing more money at the market, than the smaller breeds; they are likewise conceived to fatten in a more kind manner. If the first of these conclusions were true, they would certainly have a decided superiority, but the result of well-made trials, with equal proportions on the same pastures, shew the contrary to be the case. And in regard to the latter, it has probably proceeded from its being noticed that the largest sheep are mostly the strongest and best shaped, without considering that they are always below the quality or constitution of the soil or land on which they are fed or fattened; hence it is by no means in favour of large sheep on all kinds of land. And though it is somewhat generally allowed, that two small sheep of the same breed will equal in weight one large one, yet the latter will have less offal in proportion than they, which is certainly a desirable property in large stock of this kind.

Small sheep-stock are however more active, and feed closer than large, as well as on food which is of an inferior quality: they are capable of being stocked in the proportion of three to two on the land; they will produce more meat on the acre, and be more hardy than large breeds; they injure pastures less than large sorts; they will, where the proportions are the same in relation to the sizes, soonest become fat in the smallest, in any two sheep. This may probably be concluded as always the case, where the regularity of form and proportions are equally good and exact: as small sheep reach the state of maturity sooner than large ones, the smaller breeds are ready for sale five, six, or more months before the large, which is beneficial in every way: the smaller breeds of sheep are almost constantly preferred by the butchers, as the mutton is more suitable, saleable, and desirable at particular seasons, and as having two fifth quarters instead of one, where the weights are equal. It may, therefore, upon the whole, be considered as the interest and advantage of grazing farmers in general to breed, rear, and fatten sheep which are of the middling size, however they may have hitherto been led away by other circumstances, such as great size, extreme fatness, &c. without sufficiently taking into the account the expence at which they are produced.

What regards the *proof* of sheep is more the interest of the butcher than the grazing farmer; but it has much to do with the difference of breed, as all the more thin-fleshed breeds of sheep, as the South Down, the Norfolk, the Welsh, and several others, mostly die well for the advantage of the butcher, while those of the fleshy sort, which have improved dispositions, such as the new Leicester, &c. commonly die to his disadvantage; so that where the great object is proof, such breeds must be chosen as approach the most to the former. It is not, however, probably the breed simply, but the form of the sheep that gives the proof. But as such sheep as afford great proof mostly require a longer time in fattening, the grazing farmer should be careful not to breed or purchase such sheep as are so formed as to convert their food into tallow, in the place of enlarging the size of their muscular parts, and producing meat of a sufficiently fat quality.

The age of sheep has also much to do in the proof which is afforded by them, as the older they are, in general, the better they die in this particular, as their full growth allows the nourishment to go for fat or tallow, according to the nature of the sheep, as where the form is inclined to be bad there will be more tallow, but where the disposition has a tendency to be good, more fat produced on the outside. Keep has likewise some influence on proof as the best pastures, and such

SHEEP.

as are the closest stocked, are found in common to afford sheep that give the best proof, but it has probably less effect in this way than is generally imagined, as particular breeds give a superiority of proof on poor lands, to that of others on very rich. Time has considerable effect in giving proof to sheep, as by it fat is enabled to be collected and formed internally; but disposing of the animals at short periods constitutes the great advantage of the grazing farmer, and he has no reason to breed and fatten his stock for the benefit of the butcher and other dealers in tallow. The management in regard to breeding and crossing, as well as the nature of the wool, are said to influence the proof in these animals, as where the more ordinary forms are adhered to, the proof will be greater than in the contrary circumstances, as they have a greater tendency to form tallow and loose inside fat. And though some think long white watery wool favourable to proof, others suppose it the contrary, as denoting a disposition to fatten quickly, and as preventing inside fat by taking away the nourishment, thereby concluding fine short-woolled sheep more disposed to afford good proof. The good or bad forms and feel of particular parts, as of the head, the neck, the breast, the back, the barrel, the bone, the skin or pelt, and the flesh, often afford indications of proof, though not always such as are certain; as when the first is large, the second long and thin, the third narrow, thin, and high, the back thin and straight, the carcase fat and not well rounded, the bone long and large, the hide or skin sticky and hard, and the flesh harsh. But these different indications of proof cannot, it is evident, always be wholly depended on, as sheep may have one or more of the marks or properties which denote good proof, but which may be counteracted by others that favour disposition and other similar qualities to the contrary; consequently where two sheep are similarly formed, that which has the largest head and firmest flesh may mostly be concluded to give the best proof. The opinions on proof ought, in fact, constantly to be formed from the greatest combination of the marks of it met with in the particular animals examined.

Perhaps, so far as proof is capable of being judged of before the animals are killed, it may be known by the feel of the fat glandular part, which extends from the bottom part of the neck to the shoulder, which in lean sheep is so very small as scarcely to be felt, while in those that are properly fattened by sufficient time, or *soaked*, as it is sometimes termed, there is a different sized cushion or projection of the same fat glandular part extending to the thick portion of the shoulder; by the feel on the ribs and tail or dock, which, when it is thick, fat, and mellow, the sheep will commonly, it is thought, die well for proof. A thick loin is sometimes also thought a mark of proof in the kidney and weight. The feel of the fore dug of barren ewes and the cod of wethers, likewise shew, it is thought, proof. Many of these marks must, however, be allowed to be precarious and uncertain.

It cannot on the whole be doubted, from what has been stated on the subject of proof, but that the interests of the butcher and the grazing farmer are at variance as matters stand at present, as what is the gain of one must be the loss of the other, where the thing is well understood.

In the Agricultural Survey of the County of Norfolk, lately published, it is noticed, that the South Down breed is getting rapidly into the possession of all the country from Swaffham to Holkham; but that from Brandon to Swaffham many Norfolks remain. However, some mixture was observed even in that district. And it is stated that Mr. Coke is well satisfied of the advantage of the breed from Leicester

ewes and Bakewell tups. His flock of 160 new Leicester ewes produced, in 1802, 100 lambs; his flock of 630 South Downs produced 830 lambs living in June. The same farm, it is added, yields a most interesting comparison between Norfolks and South Downs; his former stock was 800 Norfolks, *SELLING all the produce*: he planted 700 acres, and now has 800 South Downs, *KEEPING all the produce*. Further, that his new Leicester hogs and theaves produced 8lbs. of wool each in the same year, yet they had been hard kept on feeds fed very bare. And it is stated, that though he had a high opinion formerly of the crosses between the new Leicester tup and Norfolk ewe, now (1803) his opinion is changed from much experience; so that he prefers the cross of a South Down ram on a Norfolk ewe to that of a Leicester ram. And it is added, that Mr. Holve has had the same cross, and they come to 32lbs. a quarter, at two-shear. He put a Norfolk tup and a Bakewell tup at the same time to the same parcel of Norfolk ewes, and at St. Ives fair sold the lambs fat at six or seven months old, and the Bakewells brought just double the price of the Norfolks. In April 1799, Mr. Coke, on sending Norfolk, South Down, and new Leicester three-shear wethers to Smithfield, that had been fed together, the return was:

	£	s.	d.
Average per head, Norfolks	-	-	3 0 0
Leicesters	-	-	4 2 2
South Downs	-	-	3 7 2
Ditto, fleeces included, the others being in their coats	-	-	3 15 2

And in May following above 100 going, the South Downs beat the new Leicesters by 2s. a-head. It is also observed, that at Waterden, Mr. Money Hill, with about 500 acres less land than at present, kept 27 score breeding Norfolk ewes, and sold the produce of lambs: now he has 35 score South Down ewes, and keeps their produce, selling his wool at 5s. a tod more than the Norfolk. And further, that Mr. Bevan, in 1792, had a South Down flock, of 30 score, on one farm, and having a flock of Norfolks on an adjoining farm at Knattishall, he had an opportunity of comparing the wool exactly: 34 score of Norfolks produced 43 tod at 28lbs.; and 34 score of South Downs produced 61 tod; which 61, kept till November, became 64, but the summer very wet.

	lbs.
South Downs	1708
Norfolks	1204
Superiority, just $\frac{1}{4}$ lb. each	504

Also that in 1791, the shepherd would not let his own Norfolk ewes take the South Down ram; but in 1792 he was ready enough. He said they would eat harder than the Norfolks; and would eat what the Norfolks would not; that they are more quiet and obedient than the Norfolks; so that he has done with them what he could not do with the Norfolks; folded them almost to an inch without hurdles. And that a neighbouring farmer bought three rams of Mr. Bevan, at 5l. 5s. each; but afterwards repenting, because they would *stain his flock*, Mr. Bevan offered him 6d. a-head, for all their lambs, more than he sold his Norfolks for, in the same flock, at Ipswich fair. The offer was accepted; the price proved 6s. 3d. for the ewe lambs, and 9s. for the wethers. Mr. Bevan refold the ewes for 9s. and the wethers for 10s. 6d., or 2s. 1 $\frac{1}{2}$ d. a-head in favour of the half-breds. Further, that when his sheep were Norfolks, he kept 500; but in 1794, he had 960 South Downs. That the produce

SHEEP.

duce of 116 ewe lambs, bred by Mr. Bevan at Riddlefworth, 1792, was :

	£	s.	d.
Wool, 12 tod 16lbs. -	26	8	0
48 Lambs, fold for -	32	2	0
5 Ram lambs, ditto -	8	8	0
6 Refuse ditto -	2	10	0
2 Refuse shearlings ditto -	5	10	0
10 Good ditto -	10	10	0
1 Ditto -	1	0	0
87 Ditto -	91	7	0
<hr/>	<hr/>	<hr/>	<hr/>
105	177	15	0
9 Died } -	57	14	0
2 Dunt } -			
<hr/>	<hr/>	<hr/>	<hr/>
116			
Actual profit -	120	1	0

Farther, it is also added, that he was early in trying South Down sheep, but finding them tender at lambing, went into a new Leicester cross; these he abandoned, and got back to the South Downs, but still esteems them a tender breed, and that they ought to have yards sheltered and littered for lambing in bad weather; remarking, that all the farmers he knows on the South Downs have these yards for that purpose. It is likewise stated, that Mr. Bircham, at Hackford, declares against having any favourites; he has generally bought Norfolks, and half-bred lambs; some few South Downs, but they did not answer: has had some Leicesters: any sort he can get worth his money. Little farmers, who keep a few sheep, find the polled breeds very convenient from their quietness, and therefore prefer them. Norfolk lambs bred near Cromer, bought by Mr. G. Jones at 14s., were run on stubbles in the autumn, and put to turnips at Christmas, then to layers of the first year, probably as the best food for sheep, and fold shearling wethers at Michaelmas at 55s. each; 20lbs. to 24lbs. a quarter. And colonel Butler, at Haydon, is said to be convinced that Norfolks answer better than South Downs: shearlings sometimes affording 20lbs. and 25lbs. a quarter, and 19½lbs. of tallow; he has a breeding flock of 400, and fold his wether lambs at 26s. and his ewe lambs at 24s. Mr. Johnson, of Thurning, has 40 score of South Downs, which he has been rearing these six years, having bought many ewes, and got good tups. He has, however, a good opinion of Norfolks, and will not be surprised to see them come into fashion again. In May 1792, he fold two-shear Norfolks at Smithfield for 3l. each. He admits their rambling disposition, which is much against them; and he is clear that he cannot keep so many on his farm as of South Downs. The South Down wool is not, on good keep, so good as Norfolk wool, but the fleece is heavier. Five years ago he got a lot of Yorkshires from the Wolds, white faces, polled, and the wool very coarse, but they thrived wonderfully; never having had any sheep that did better, inasmuch, that he was sorry when he parted with them. Norfolks, he thinks, will bear folding better than South Downs. The latter will, however, come to hand rather sooner, but not on ling: has had three-shear South Downs of 28lbs. a quarter. Also at Snettisham, Mr. Styleman, the writer asserts, keeps 2000 of various breeds, South Downs, new Leicesters, and half and half; in number considerably more than when, on the same land, he kept Norfolks: his farm may, and probably does, produce more sheep-food than it did at that time; but he is perfectly clear in the great superiority of the number, this circumstance deducted, and that the profit is considerably

greater; and he is clear also in the superior hardiness and kindliness of feeding of the new breeds. Of all cross-breeds, he thinks the first cross of the Leicester tup on the Norfolk ewe the best, and that wool now (1802) sells at 46s. a tod; fleeces 4lbs. And at Hillingdon, all are either Norfolks or half-breeds, a Leicester tup on a Norfolk ewe. Captain Beacher thinks there are no sheep in the island which the Leicester will not improve. He has grazed many Wiltshires, and thinks them the best of all for cole-grazing in the fens. But Mr. Beck, of Castle Rising, has had South Downs thirteen years, beginning with some from Mr. Tyrells, of Lamport, and has imported three or four times since. He has now 800, and is quite convinced of their superiority to Norfolks: when he was in that breed, he had not half the number; but after abating fully for improved husbandry, and every other circumstance, he is clear that there is a superiority of four to three. His fences are and must be bad, and in such a farm quietness is a vast object: his farm 486 acres. He gained the first prize for ewes, both the last and this year at Swaffham, and also at Holkham. The surveyor examined his flock attentively, and it certainly is a very beautiful one. His wool now averages eight to a tod, equally of hogs and ewes: his Norfolks totted twelve: he is clear that, take the country through, they average half as much again as Norfolks. Before he took the farm there were fifty sheep on it, and a dairy of cows. What an improvement! However, in the vicinity of Downham are found all sorts of breeds: towards the river, Lincolns and Leicesters; higher up, Norfolks and South Downs. Mr. Saffory likes the South Downs best, but thinks that if as much care and attention had been exerted to improve the breed of Norfolks as the South Downs have experienced, they would by this time have been a very different sheep. Norfolk three-shear wethers fold in April last at St. Ives, at from 4l. 4s. to 4l. 10s. each. At Bretenham, Mr. Twilt keeps 68 score of breeding Norfolk ewes on 1800 acres of poor land. He had a South Down tup some years ago from Mr. Crow, but he could not perceive that the breed did better than Norfolks, though they stood the fold to the full as well.

In the district called Marshland, Mr. Dennis, of Wigenhall, St. Mary, grazes only the best Lincoln wethers; he buys from May-day to Midsummer; keeps them over-year, clipping twice, average price 50s. to 60s. and sells at 65s. to 75s. getting 18lbs. in the two fleeces: his good land will carry six *per* acre, on an average, in summer; in winter, two on three acres; and these will quite preserve their flesh; if the season be favourable, will get something: he thinks that there is no other breed so profitable here; even a stain of the new Leicester is hurtful, as they will not stand the winter so well. Sheep the chief stock, though some Lincoln bullocks. He never gives hay to sheep, nothing but grafs; 32lbs. a quarter his average of fat wethers. But Mr. Swayne, of Walpole, prefers the cross between Lincoln and Leicester: he buys them shearling-wethers, about Lady-day; last year 3l. to 3l. 10s. each, but has had them at 36s. and 38s. He clips the best twice, three to a tod, which he likes better than heavier fleeces of sheep demanding more food. Some give 17lbs. or 18lbs. of wool. At Michaelmas he culls the worst, or buys cole for them, if reasonable; sells all by Midsummer, making 8s. or 10s. a-head, when bought in high, besides the wool. Very few beasts are kept.

Also in Hertfordshire, some prefer the South Downs to Wiltshires, as the latter have the goggles often, but the South Downs never. But the long-legged Wiltshires suffer less in folding on wet land. But in other places the result of the comparison seems to be, that South Downs do better on

SHEEP.

grafs-land than Wiltshires, and will in that case thrive more, and better support the hardships of short food; but on arable land with plenty of turnips, clover, rye, tares, &c. in ample provision, the Wiltshires are more profitable than the South Downs. The Wiltshires are large sheep, and consequently require to be well kept. In the trials of Mr. Hale, of King's Waldon, for five or six years, nothing beats South Downs, where there is much grafs; but on artificial grafs and turnips, without a breadth of natural grafs, they will not do like the Wiltshires; for which reason Mr. Roberts, on his own farm, keeps Wiltshire ewes, and crosses them with South Down rams; so that they lamb in March. When put to grafs they are folded, and some lambs are sold at 3s. in the beginning of harvest; some twins at 31s. 6d.; and the best are kept. He approves so much of them, that he intends to continue them. Mr. Hale's flock is a capital one, and the wool remarkably fine. And between thirty and forty years since, Mr. Calvert of Albury had Lincoln sheep, but sold them, from conviction that they did not answer: he was then, for about twenty years, in the Wiltshire breed; and lastly, he changed these for the South Downs, which he has had for the last seven or eight years, and prefers them to all. He has no other but lord Pelham's breed, both lambs and ewes, and considers the more modern attempts to raise a *finer* race, as likely to prove mischievous: he will not have any thing to do with them. His six-toothed wethers weigh eleven stone and a half. He finds the breed extremely healthy: they very rarely die; and are subject to much fewer distempers than the Wiltshires. And Mr. Smith has changed Wiltshires for South Downs. He has about 400 in all, some of them Wiltshires; they are *fed and worked together*, and folded on wet lands. The South Downs in exceeding good order, but the Wiltshires very inferior. But about Barkway, South Downs are not yet introduced; Mr. Whittle, however, gave it as his decided opinion, that *feed and work* Wiltshires and South Downs together in the same manner, and the former will prove to be the most profitable; the latter are much injured by the dirt, as they are too short in hair and legs; it was tried at Kimpton Hoo, and such was the result. He has sold Wiltshire wethers thrice shorn, at 7l. 14s. each. And Mr. Doe, of Bygrave, keeps Wiltshire ewes, which he crosses every year by new Leicester rams; but goes no farther than the first cross. These answer greatly, whether the sale be fat lambs or shearlings. He does not approve of South Downs, on account of their inferior weight.

However, from the high character which South Down sheep have lately attained, it may not be uninteresting to give Mr. Young's account of their first introduction into Norfolk. He remarks, that when once an improvement has spread so much as to become an object of importance, there are generally many claimants for the merit; and if such claimants are only heard of many years after, but little attention is due to them. With regard to the neighbouring county of Suffolk, he can speak with some accuracy, but should not mention it on this occasion, were not the fact connected with the introduction into Norfolk. In May, 1785, he published an account of an observation he had made in 1784, the year he brought them into Suffolk from Suffex; and it being printed at the time, the fact will admit of no doubt. He recommended them strongly to every gentleman and farmer he conversed with on the subject; and at his persuasion, as many well know, the late Mr. Macro, of Barrow, purchased that flock which the earl of Orford, after his death, bought and established at Houghton. Mr. Macro died in 1789. And in a paper printed in the *Annals*, in 1790, he (Mr. Young) remarks, "I have had six and twenty

years' experience in Norfolk sheep, and once thought so well of them, as to carry them into Hertfordshire; but in the advance of my practice, I began gradually to doubt the superior merit of that breed. I thought that of all the sheep which I had examined particularly, none promised to answer so well for the general purpose of the counties of Norfolk and Suffolk as the South Downs. I began the import in 1784, and in 1790 had 350. I had too much friendship for the late Mr. Macro, to advise him to try any experiment that I was not clear would answer to him. I repeatedly urged him to try the South Downs; he listened to me with attention for some time, but would not determine, till having seen the number I kept proportionably to the quantity of land, and at the same time with some Norfolks, it proved to him that the South Downs were worth attending to; and the journey I persuaded him to take into Suffex, giving him an opportunity to converse with various noted sheep-masters there, he determined to make the experiment: he went over, previous to Lewis fair, and bought a flock of them. The lambs sold well at Ipswich fair. Mr. Le Blanc, at Cavenham, also turned South Down rams to 700 Norfolk ewes: he found no difficulty at Ipswich; and his shepherd, after three years' obstinate preference to Norfolks, gave up his old friends, and actually set South Downs for his shepherd's stock. Whether the breed should or should not, in the long run, establish itself, I have the satisfaction of feeling that I have done no ill office to my brother farmers by introducing it. From the daily accounts I receive, I have good reason to believe that it will be established."

The farmers in Oxfordshire employ many different sorts of sheep, as the Wiltshire, Berkshire, and some others; but the South Down and new Leicester, and their crosses, are fast driving the other sorts out of the county, as being more profitable in the number that can be kept on the same extent of land, in fattening more expeditiously, and at earlier periods of their growth, in folding equally well, and in the value of their wool. Some, however, think, that the long-woolled sheep are very profitable on farms of the stone-brash kind, and have large flocks of that sort. In this district, in general, the quantity of sheep that is kept is large, in proportion to that of the extent of the farms.

In Berkshire, the large Wiltshires and the breed of the county are giving way to the South Down, and other small-sized breeds, as yielding more profit, fattening quicker, and doing better in general. The new Leicester, so far as they have been tried in proper situations, have also answered well. Some crosses of these smaller breeds have likewise been employed with considerable success.

In the county of Essex, several sorts of sheep-stock are made use of by the farmers, as the Norfolks, Wiltshires, Lincolns, new Leicesters, South Downs, and different crossed kinds; but the superiority and advantage of the Downs are now almost every where admitted. The Dishley or new Leicester sort is also held in much estimation in many places, especially where the soil is of a dry light nature; as the wether lambs of this breed, and that of the Downs, on being constantly kept together on the same land, until they became fat, the former were invariably drawn off the first, and were the fattest and heaviest. Besides, rams of this sort are preferred for being put to Norfolk ewes, to those of the other breed; as the produce is larger, and sooner fat. The new Leicesters are by some, however, thought inferior to the South Downs, as being such bad breeders; one hundred of them only producing eighty lambs, while the same number of the Downs will bring one hundred and twenty.

SHEEP.

In the district of Devonshire, many kinds of sheep, besides the native breeds, are had recourse to by the farmers, as the Dorset, new Leicester, Cotswold, and South Down, with crosses of these and several other kinds, as may be seen by the table introduced above. The last of these breeds seems to be fast making its way, in some places where the land is dry, in this county too; but other sorts and crosses are held in great favour for different purposes and uses, as for mutton, wool, feeding, and different others.

In many of the northern and other counties, as in Yorkshire, Lancashire, Cumberland, and several others, the new Leicester, South Down, and different improved breeds, are now beginning to be had recourse to, and supplanting the old native or other kinds.

The trials have hitherto been so few, in regard to the comparative advantages of different breeds of sheep, in what regards the relative proportion of food to mutton, offal, tallow, live and dead weight, and many other points, that the stock-farmer has been kept much in the dark. In order, however, to fully clear up and ascertain these essentially important matters, so absolutely necessary to the perfect knowledge of the subject, the earl of Egremont lately ordered the following experiment to be made. The wether lambs of the preceding spring were ordered to be put up by themselves, into a paddock adjoining the Home-park. There were of

South Down wether lambs	29—12	best saved for rams.
New Leicester do.	25—6	do. saved for do.
Half-bred new Leicester and South Down wether lambs, from same get as above	12	18
Romney-Marsh wether lambs, out of Mr. Wall's ewes by his own ram, which, from the custom there, of not having artificial food, were not lambed till May, being therefore nearly two months younger than any of the rest	7	
	73	
Deduct rams	18	
	55	

These fifty-five wether lambs, put into the paddock in the month of August, were brought up and examined on the 25th of the June following, when it was found that twelve of the South Down, and all the half-bred South Down and new Leicesters, were in a marketable condition; but that none of the true new Leicester or Romney-Marshes were in any proper state for sale.

	£	s.	d.
Of the South Downs, ten out of the twelve were sent off to Smithfield market, some days afterwards, and fetched <i>per</i> sheep	1	14	0
Of the half-bred new Leicesters and South Downs, ten of the twelve, sent a week before to the same market, brought <i>per</i> sheep	1	13	0

It is remarked, that the half-breds were seemingly the better sheep; but they went to a bad market, when the prices were low.

The two of the half-bred sort that remained, and which were in equal condition for the market, were kept back, as forming part of the trial, detailed next column.

Here, however, it is necessary to pause, it is said, as the experiment is already decisive of one point, namely, that at this age of six months, as noticed above, those two breeds were so much more advanced than the others, that they might be profitably cleared from the land, and a fresh stock sent in. It will remain, it is said, for the future progress of the trial, to ascertain whether such fresh stock would not pay better, than continuing the old; and for this purpose it may be calculated, that the sheep now sold at the above market at 34s., with the addition of 3s. for wool, pay for sixty-four weeks 7d. the pound from the time of their being lambed. This is noticed to be a very considerable profit; and that if it should turn out, that keeping them much longer is not attended with an advantage somewhat proportionate, it will clearly prove the superior benefit of that breed, which may be got rid of at so early an age. And it is thought worthy of remark, that not one of the true new Leicesters being in any condition fit to be drawn off in the first lot for market, is a circumstance most strangely contradictory of assertions without end, that fattening at an early age is almost peculiarly a characteristic of that breed.

But to proceed with the trial.

	Weighted lbs.	Ten Weeks' gain. lbs.	Gain per 100 lbs. lbs.
Sept. 7. South Downs	273	33	13
Leicesters	258	46	21
Half-breds	294	34	13
Romney-Marshes	270	34	14

It is noticed, that this result is not very different from what might have been expected; for as the Romney-Marshes and new Leicesters were very much behind the South Downs and half-breds ten weeks before, it was natural to suppose, that when they did begin to thrive, they would do it in a more rapid manner.

	Weighted lbs.	Loss in 12 Weeks. lbs.	Loss per 100 lbs. lbs. oz.
Dec. 1. South Downs	264	9	3 0
Leicesters	251	7	2 0
Half-breds	282	12	4 0
Romney-Marshes	269	1	0 6

It is considered as very material, in all trials of this nature, to note the losses, as making such attempts double, by not only shewing when the sheep thrive, and which do best, but equally by marking when they go backward, and which breed is most capable of withstanding those circumstances which operate against them all. In the above scale, the difference is not very material. In that lot which did the worst, the loss, it is said, amounts to about 1d. *per* week; but that it is unfavourable to every lot, that in a period including the best part of the autumn, as sheep should thrive, when the weather is suitable, deep into the month of November, none of them should have gained, which they ought to have done considerably. Their pasture, however, though good in quality, was bare.

The result being found, the sheep were ordered to be starved for twenty-four hours; and after which, to be turned out for other twenty-four hours; proposing, by thus weighing them, to ascertain the quantity of food eaten, and the quantity voided: it being rightly conceived, that if, upon the repetition of such trials, there existed any remarkable superiority, or any material difference, between the respective breeds, it might throw some light upon the general inquiry.

South

SHEEP.

	Loft by Starving.	Loft per 100 lbs.
	lbs.	lbs. oz.
South Downs	8	3 0
Leicesters	11	4 0
Half-breds	17	4 6
Romney-Marshes	5	0 14

The sheep were then turned out, and twice weighed, after twenty-four hours eating each time.

	Gain in the 1st 24 Hours.	Gain in the 2d 24 Hours.	Total.	Gain per 100 lbs.
	lbs.	lbs.	lbs.	lbs. oz.
South Downs	1	6	7	2 10
Leicesters	6	6	12	4 13
Half-breds	10	9	19	6 12
Romney-Marshes	0	5	5	1 13

The result of these weighings shew that the half-breds lost most, and gained most; that the Romney-Marshes lost least, and ate least; that the Leicesters lost more than the South Downs, and ate more. It is suggested, that such trials must be repeated many times, before conclusions can be fairly drawn. How the Romney-Marshes, in the first twenty-four hours, could gain nothing, is not to be accounted for, as the weighing was performed with accuracy.

Weighed again in the succeeding month of March, in the next year, which, as it will mark the loss sustained by the severest part of the winter season, deserves particular attention. They were at grass the whole of the time.

	Weighed	Loss in 4 Months.	Loss per 100 lbs.
	lbs.	lbs.	lbs.
South Downs	253	11	4
Leicesters	214	37	14
Half-breds	253	29	10
Romney-Marshes	254	15	5

The result here shews that the Leicesters, which is remarkable, suffered the most; from which it is thought, that it may fairly be concluded, so far as one trial goes, that the great peculiarity of that breed is not by any means what has been contended for, a capability of supporting itself on little food; but that, on the contrary, it demands a very plentiful nourishment, and will bear the want of it worse than any of the other breeds.

The half-breds are the next in the order of demerit: the South Downs are the best of all.

	Weighed	Gain in 12 Weeks.	Gain per 100 lbs.
	lbs.	lbs.	lbs.
June 19. South Downs	299	46	18
Leicesters	275	61	28
Half-breds	310	57	22
Romney-Marshes	317	63	24

The period from the 30th of March to the 19th of June necessarily forms another interesting portion of the trial, as it takes in the whole flush of the spring growth of grass. Here the result, it is said, is also remarkable, and strongly in confirmation of the preceding observations on the Leicesters; for when in favourable circumstances in regard to food, as in the present case, from season, they exceed all the rest. The Romney-Marshes, however, approach near to them; and as these had lost, in pinching circumstances, much less, their superiority upon these two weighings seems to be clearly ascertained; and which will appear the plainer, by comparing the weight of December 1st with that of June 19th.

	Dec. 1st.	June 19th.	Gain.	Gain per 100 lbs.
	Weights.	Weights.	lbs.	lbs.
	lbs.	lbs.	lbs.	lbs.
South Downs	264	299	35	13
Leicesters	251	275	24	9
Half-breds	282	310	28	9
Romney-Marshes	269	317	48	17

The merit of the Romney-Marshes, in this stage of the trial, is, it is said, conspicuous. The South Downs are next, the Leicesters and half-breds being equal.

	Weighed.	Gain per 100 lbs.
	lbs.	lbs.
Sept. 7. South Downs	316	5
Leicesters	312	11
Half-breds	310	8
Romney-Marshes	337	6

The Leicesters here, it is observed, continue to take the lead throughout the summer. So long as the food is plentiful, they beat all the others; and this part of the experiment goes to prove a most important point, which has indeed been long suspected, that in good situations no breed is so profitable to the grazier. The half-breds are found the next to these.

The five remaining Romney-Marshes were sent to Smithfield on the 4th of July, and brought 48s. each; and on August the 7th, ten of the remaining Leicesters went at 48s. each, also seven at 40s. each; so that the profit for two years and two months food, added to the value of the wool, is, it is said, 5d. and a fraction *per* week for the Romney-Marshes, and from 4d. to 4½d. for the Leicesters, from the time of their being lambled.

The former part of the experiment will shew that the South-Downs and half-breds in 64 weeks age gave 7d. *per* week profit; and that the Romney-Marshes and Leicesters, kept until they were nearly twice the age of the others, namely, 108 weeks the former, and 117 the latter, only gave a profit of from 4d. to 5d. *per* week. This is, it is said, a most interesting circumstance, and which manifestly tends to ascertain how much better it would be to the grazier to get rid of these sheep at an earlier age, and restock his land with those which are most saleable at the earliest period.

November 21st to December 25th. Weighed again.

	lbs.	Gain.	Gain per 100 lbs.
	lbs.	lbs.	lbs.
South Downs	320	4	1
Leicesters	326	14	4
Half-breds	346	6	1
Romney-Marshes	331	loft 6	loft 1

This, it is supposed, is perhaps the most striking period of the experiment. By the last weighing, if turned to, it will be seen that the Leicesters had outstripped all the rest, and that the superiority is still maintained.

The above details of the practices of different districts, experiments, and remarks, must place the profits and advantages of different breeds of sheep for the purposes of the sheep-farmer, in a clear, satisfactory, and striking point of view. With respect to the wool of different sheep, we refer to the next article, and WOOL.

Different Kinds of Sheep-Management.—In the practice of sheep husbandry, different systems are had recourse to, according to the extent and nature of the farms on which they are kept, and the methods of farming that are adopted on them; but under all circumstances, the best sheep-masters constantly

SHEEP.

constantly endeavour to preserve them in as good condition as possible at all seasons. With the pasture kinds of sheep this is particularly the case; and with the view of accomplishing it in the most complete manner, it is useful to divide them into different parcels or lots, in respect to their ages and sorts, as by that practice they may be kept with greater convenience and benefit than in large flocks together, under a mixture of different kinds; as in this way there is not only less waste of food, but the animals thrive better, and the pastures are fed with much more ease. The advantage of this management has been fully experienced in many of the northern districts, where they usually divide the sheep-stock into lambs, yearlings, wethers, and breeding ewes; and in this method it appears not improbable that a much larger proportion of stock may be kept, and the sheep be preserved in a more healthy condition.

The nature of the management with a breeding stock is that the sheep-master must act according to his circumstances, situation, and the capital which he possesses, either felling the lambs to go to keep, fattening them for grafs-lamb, suckling them for house-lamb, or keeping them on to be grazed and fold as store or fat wethers; the ewes being sold lean, as they are called, or fattened, as circumstances, profit, and convenience, may point out. Another practice, but which requires much capital, as well as knowledge, experience, and attention, is that of breeding and fattening off all lambs, both wethers and ewes, especially where markets for their sale, when fat, are conveniently situated. But where this system is too extensive, it may be partially acted upon, varying the plan according to capital, circumstances, and the nature of the times. In which case, whenever store stock becomes extravagantly high, it is mostly a good way to sell. But a method which is attended with the least trouble and hazard, is that of purchasing a store flock, as lambs, wethers, and what are termed crones, or old ewes; some of the last sort often proving with lamb, may be fattened off with them to good account. It is likewise often the case that ewes are disposed of in lamb, or with lambs by their sides, in what are termed couples, in which circumstances it is frequently a good practice to make annual purchases of them, in order to the fattening of both, and selling them in that state within the year. The system of breeding can only be had recourse to with effect and advantage in situations or on farms, where there are extensive tracts of land fit for the pasturing and support of these animals, but not the fattening of them; the more rich deep grafs-lands being adapted to their fattening, and thereby affording a better profit, especially when quickly performed with a proper sort of this kind of stock, as that of good wethers.

But in the purchasing of sheep, which is often done from very distant fairs and markets, much care and circumspection are necessary, whatever the sort or intention with which they are bought may be. In these cases much advantage, especially when at a considerable distance, may be derived by employing a salesman upon the spot.

And the appearances which shew the sheep to be in a proper sound state of health, are a rather wild or lively briskness, a brilliant clearness in the eye, a florid ruddy colour on the inside of the eyelids and what are termed the eye strings, as well as in the gums, a fastness in the teeth, a sweet fragrance in the breath, a dryness of the nose and eyes, breathing easy and regular, a coolness in the feet, dung properly formed, coat or fleece firmly attached to the skin, and unbroken, the skin exhibiting a florid red appearance, especially upon the brisket. Where there are discharges from the nose and eyes, it indicates their having taken cold, and should be attended to by putting them in dry sheltered

situations. This is a necessary precaution also in bringing them from one situation to another while on the road.

It may be noticed that, with sheep-farmers, the common practice, except in particular instances, has been to leave the ewes for the purpose of breeding without any selection; but where good sheep-stock is the object, much attention should be paid in choosing such as are the most perfect, and that possess, in the highest degree, those qualities or properties which are wanted, whatever the breed or variety of sheep may be; as it is only in this way that a good stock can be raised and preserved. And it is a business that should always be performed at the time they are turned to the ram, if it has not been done before; and this is equally necessary in regard to the rams, that they may be adapted to the ewes. The author of the Farmer's Calendar has observed, that the late duke of Bedford, in attending to this object, had every ram with the lambs got by him the preceding year put in distinct pens, that he might not only examine them but their progeny, previous to his deciding "what ewes to draw off for him," which is certainly a method highly deserving of imitation by sheep-farmers in general. Such attention, united with a careful selection of cull lambs, must, the writer thinks, keep a stock in a state of progressive improvement, proportioned to the accuracy of judgment, eye, and hand of the farmer who practices it. And it is observed in the Agricultural Report of Norfolk lately published, that Mr. Coke readily assists, not only his tenants, but other neighbouring farmers, in sorting and selecting their South Down ewes, &c. and distributing them in lots to the rams according to the shapes and qualities of each. He puts on his shepherd's smock, and superintends the pens, to the sure improvement of the flock; his judgment is superior and admitted. The writer has seen him, and the late duke of Bedford, thus accounted, work all the day, and not quit the business till the darkness forced them to dinner. See *Sorting Sheep-flock*.

Farther, it has been remarked in a late practical work, that the most advantageous and proper age for ewes taking the ram in the different breeds, has not been fully shewn; but from a year to a year and a half old may be sufficient, according to the forwardness of the breed and the goodness of the keep. Some judge of this by the production of broad or sheep's teeth. It should not, perhaps, be done while too young in any case. And in regard to the season of putting the rams to the ewes, it must be directed by the period at which the fall of the lambs may be most desirable, which must depend on the nature of the keep which the particular situation affords; but the most usual time is about the beginning of October, except in the Dorsetshire ewes, where the intention is suckling for house-lamb, in which case it should be much earlier, in order that the lambs may be sufficiently forward. But, by being kept very well, any of the breeds will take the ram at a much earlier period. Where the rams are young, the number of ewes should seldom exceed sixty for each ram; but in older rams a greater number may be admitted without inconvenience, as from one to two hundred; but letting them have too many should be cautiously avoided, as by such means the farmer may sustain great loss in the number of the lambs. It is found that the ewe goes with lamb about the space of five months, consequently the most common lambing-season is March, or the early part of April; but it has been observed, that in many of the more southern districts, where sheep-husbandry is carried on to a considerable extent, some parts of the ewe-stock are put to the rams at much earlier periods, so as to lamb a month or six weeks sooner; a practice which is attended with much profit and advantage in many situations where early grafs-lamb is in great demand. It is usual for the

SHEEP.

the rams to remain with the ewes for a month or six weeks, and in some cases longer, in order to complete the business of impregnation, which in some districts is ascertained by smearing the fore-bows of the rams with some colouring substance. The method formerly in practice, and which is too commonly the case at present, of turning a number of rams among the flocks, is highly exceptionable, as tending to prevent the main object, and injure the rams. A better way is to let each ram have a proper number of ewes, and with very choice stock to keep the ram in an inclosed small pasture, turning a few ewes to him, and as they are served replacing them with others. By this means there is more certainty, and more ewes may be impregnated. In such sort of fine stock, it is likewise of great utility to keep the rams during this season in a high manner. In this view a little oats in the straw, or a mixture of barley and pea-meal, are excellent. Where ewes are backward in taking the ram, the best means to be employed are those of good stimulating keep. The rams should always be continued with the ewes a sufficient length of time. It is stated in the General Treatise on Cattle, that the ewe will breed twice and even thrice a year, if it be made a point to produce such an effect by attention and high keep, since she will receive the male indifferently at any season, and, like the rabbit, very soon after bringing forth. And that Lisle gives an instance of three of his ewes, well kept, lambing at Christmas, fattening off their lambs at Lady-day, and producing lambs again the first week in June. It seems they stole the ram immediately after lambing, but brought the second time only single lambs, although of a breed that generally produces twins. The former writer thinks there is no doubt but the sheep would produce young thrice a year, were the bad practice reformed to, which has been so currently recommended with the rabbit, of allowing the male immediately after parturition; the ready way to render both the female and her progeny worthless. Could the lambs be advantageously weaned at two months, sufficient time would, he conceives, remain for the ewe to bring forth twice within the year; for example, suppose the young ewe tupped in August, the lamb would be dropped in the middle of January, and might be weaned in mid March, the ewe again receive the ram on the turn of the milk, like the sow, perhaps in or before April, she would then bring forth within the twelve months, or in August. This plan would, he thinks, at least injure the dam infinitely less than suckling during gestation.

And it is necessary, that during the time the ewes are in lamb they should be kept in pastures, and as free from disturbance as possible, being carefully attended to, in order to prevent accidents, which are liable to take place at this time, such as those of their being cast in the furrows, &c. Where any of the ewes slip their lambs, it is advised by Mr. Bannister that they should be immediately removed from the flock. They also require, under these circumstances, to be kept as well as the nature of the farm will admit, in order that there may be less loss at lambing-time, from the ewes being stronger, and the lambs more healthy, and better capable of contending with the state of the season at which they may be dropped. At lambing-time every possible attention is to be paid. The shepherd should at this period be particularly careful and attentive to afford his assistance where it may be necessary. He should constantly have regard to the suckling of the lambs, and to see that the udders of the ewes are not diseased. His attendance will often be required in the night as well as the day. At this season covered sheep-folds are often of very great advantage, in saving and protecting both ewes and their lambs. And in respect to the number of lambs, it is remarked by the author of the

work on Live-stock, that the ewe brings most commonly one, next in degree of frequency, two, rarely from three to five lambs at a birth. This property of double birth is, he says, in some instances, specific; the Dorset sheep usually yeaining twins; and the large-polled Belgic sheep, with their descendants, our Teefwater, doing the same, and producing occasionally more at a birth. Other breeds bring twins in the proportion of one-third of the flock, which is supposed to depend considerably on good keep. A certain number of ewes *per centum* prove barren annually: the cause very rarely, natural defect; sometimes over-fatness, a morbid state of body, from poverty, or neglect of the ram; in other words, want of system in the shepherd.

Further, it has been recommended, that where rich pastures, or other sorts of good grass-lands cannot be reserved for their support, turnips, or other kinds of green food, should be provided for the purpose, and given them in a suitable manner; but where it can be done, it is always better to leave this sort of food untouched till about the period of lambing, when it should be regularly supplied, in proportion to the necessity there may be for it. The ewes also demand at this time much care, to see that they are put upon a dry sheltered pasture, free from disturbance, and that neither they nor their lambs sustain injury from the too great severity of the season. Whenever this is the case, they should be carefully removed into a proper degree of warmth and shelter, until perfectly restored. It is likewise a necessary, as well as a useful practice, as they lamb down, to take them and their lambs away from the common stock, putting them into a piece of turnips, or fresh dry pasture, where there is shelter when necessary, as by this means much fewer lambs will be lost than would otherwise be the case. It is also found, that by a proper supply of turnips, or other similar green food at this period, the milk of the ewes is much increased, and the growth of the lambs greatly promoted; which is of much future importance, as when they are stunted at this early period of their existence, they never turn out so well afterwards for the farmer. With the green and root crops, and preserved after-grass, hay, straw, corn, and oil-cake, are in some cases made use of in the winter support of sheep-stock. With turnips, where the soil is not sufficiently dry to admit the sheep, it is the practice to draw them and convey them to a sound firm pasture, that the ewes may be baited upon them once or twice in the day, as there may be occasion, care being taken that they are eaten up clean, as the circumstance of their being thus eaten may serve as a guide to the farmer for the supply that may be daily necessary. In this way this sort of food will be consumed with the greatest economy. Where the land is perfectly dry, and the intention is to manure it for a grain crop, eating the turnips on the land, by means of portions hurdled off as wanted, is a good practice. And with this sort of food, especially where it produces scouring in the ewes, green rotten hay, cut straw, or pease-haulm, should constantly be given, and also with rape, &c. Mr. Young has stated, that in some parts of the kingdom, the best farmers give their ewes and lambs bran and oats, or oil-cake, in troughs, while they are feeding on turnips; but he suggests, at the same time, that it must be a good breed for such a practice to repay. And it has been advised, when the weather is very wet, stormy, or there is much snow upon the ground, that the ewes and lambs should have hay given them in baits as may be necessary, which is mostly done in covered moveable racks, a portion being given fresh every day. It is, however, much better to have it cut into chaff, and given in troughs, as much less waste is made. There is still a higher practice of feeding made use of by some farmers, with ewe-stock the

SHEEP.

the more improved kinds, and which is said to have been found to answer better than the common keep in particular cases; which is that of employing parsnips or carrots with hay of the green rouen kind, or a portion of pea, bean, or barley-meal, also malt-combs, with potatoes and hay, &c. These sorts of keep are, however, obviously much too expensive, except under particular circumstances, and for the more improved breeds.

It is obvious, that where shelter can be provided, it will always be of much benefit to the sheep. But it has been observed, that the practice of letting them to the haystacks, which is common with some farmers, is slovenly and wasteful, and which, though it may afford a degree of shelter, should never be attempted when the other methods can be had recourse to. It has also been suggested by Mr. Young, as an excellent method, though not essentially necessary, to allow the sheep, whether the weather be bad or not, a small proportion of hay daily while at turnips. And it is supposed that by this careful management, and the use of stubble turnips when necessary, the ewe and lamb-stock may be well supported through the severity of the season, and be brought on in the best possible condition until the turnips are finished in March, which should always be the case when the preserved grafs or rouen may be ready to receive them; which is considered by some as the most to be depended upon through this and the following month, which, with the first week in May, is the most difficult period of the year to the stock-farmer. On dry meadows and pastures it is invaluable in this view, though at first sight it may have an unpromising appearance, from the covering of decayed autumnal grafs that is upon it; but which, when removed, presents a new growth of fresh green grafs, five or six inches in height, brought up by the shelter and warmth afforded by the covering of old grafs. This is found to agree remarkably well with the sheep, as they consume both together, having, as it were, both hay and grafs in the same bite. It is, indeed, supposed impossible to keep a full stock of sheep so cheaply in April by any other method as by this. Tolerable rouen will carry ten ewes an acre, with their lambs, through the whole month. Such rouen may be worth in autumn ten or twelve shillings an acre; in April it is worth thirty or forty shillings; and if it be a backward season, a farmer that has it would not be tempted to sell it for much more. But in the support of his sheep and lamb-stock, if the farmer be provided with a sufficient extent of watered meadow, he may fully depend upon that without any other provision for this period.

But in cases, however, where these cannot be fully depended on for the support of the sheep-stock at this difficult season, the most improved practice is, in place of depending on turnips and hay with rye sown for the purpose, young wheats, and the run of the pastures, to let the turnips continue, so as that their shoots may become an object of sheep food, and to have annually a portion of tolerable good land, sufficient to the extent of the flock, under rye-grafts and clover, so as to be ready in the spring to take the sheep from turnips, and support them till the time of turning upon the pastures. The same writer remarks, that this conduct is an improvement on the other, as it gets rid of three great evils: depending on rye, which is soon eaten; feeding on wheat, which is pernicious to the crops; and turning too soon into the general pastures. But at the same time that it effects this advantage, it is open to some objections, which make further improvement necessary. Keeping the turnips long in the spring is very bad husbandry. It damages greatly the barley crop, both in robbing the

land, and preventing it from being sown in proper time: nor is the food of great consequence, for many acres of turnip-tops are requisite, the number of which must be in proportion to the stock of sheep; and as to the roots, they grow so sticky and hard after the tops are at all advanced, that their value is trifling. With respect to ray-grafts, the clover mixed with it is seldom above three inches high at this season; and a great breadth of ground to a given stock must be assigned to keep the sheep through April. The number of acres of that young growth necessary to keep a hundred sheep and lambs, is, it is said, surprising; so that these farmers, although they manage to spring-feed more sheep than the worst of their brethren, yet effect it at a great expence, and at last not in any degree comparable to what might be done. A turnip should never be seen on the ground after March. For the month of April the farmer should have a field of cabbages ready, which, yielding a great produce on a small breadth of ground, reduces the evil of a late spring sowing; and, if he manages as he ought, totally excludes it. The turnip-cabbage, and ruta бага, will last as long as wanted; and though they run to seed, yet the bulbs will not be sticky. The green borecole may be fed off several times: it is impenetrable to frost, and will make shoots in the winter. And another crop, continues Mr. Young, for feeding sheep in spring, which is of particular merit, is burnet. An acre of it managed properly, will at this season yield much more food than an acre of clover and ray-grafts. It should be four or five inches high in November, and left so through the winter. Burnet has the singular quality of maintaining its green leaves through the winter; so that, under deep snows, you find some luxuriance of vegetation. From November to February the crop will gain two or three inches in growth in the young leaves, and then be ready for sheep. It will be better in March, and if kept, ready in April, not only for sheep, but horses, cows, or any other stock. These systems of feeding and management are, however, in practice much varied according to the nature of the farm and the kind of sheep that are kept. In Norfolk, with Mr. Bevan's flock, which consists of forty-five score of the South Down kind, the following is the arrangement. The tups are put to the ewes about the 10th of September, for two months, being fed on the layers and pastures, and are folded on the old layers for wheat: after wheat-sowing they are folded on the pastures and layers till the time of yeaning, during which they lie on the pastures without fold, and have turnips thrown to them, with plenty of good hay. The fattening sheep are on turnips and hay, from Michaelmas to the end of March, followed by the hoggits. In April the couples go to cole-feed in hurdles; from cole to rye; from rye to the new layers, if forward enough, otherwise to the water-meadows, till the beginning of May; and from thence to the new layers, being still in hurdles, with a good deal of room to fall back, and continue so on the layers till about the 10th of June, when the ewes are washed for clipping, and until the lambs are weaned: the ewes then go to fold with the shearlings on the fallows intended for turnips, and the lambs are put to fresh grafs reserved for that purpose: all the sheep on turnips and cole having hay, they consume about twenty-five tons. The general winter provision is 80 acres of turnips, 20 of cole, and 30 of rye, for the spring. Mr. Bevan ploughs in his rye-stubbles before the flocks are carried to turn in the scattered feed, harrowing in half a peck of cole-feed for sheep-feed in the spring, and finds it of very great service. The latter, after feeding, stands for a crop. He values his turnips on the average at 30s. per acre, and cole at 25s. After turnip-sowing, the

SHEEP.

flock is folded on old layers for rye, till the end of August, when the ewes intended for breeding are put to good pasture till the tups are let in. But in 1802, the tups now put to the ewes about a week later, and the lambs not weaned till the latter end of June. Provision this year, 100 acres of turnips, 30 cole, 30 rye, for 25 score breeding ewes, 15 score hoggits, 20 tups, 10 score fattening stock; 51 score in all.

Turnips, as a holding-out winter food for sheep, are unquestionably excellent, particularly when not given in too large quantities, and with some sort of dry food with them, as sainfoin hay in this season, common hay, cut pea, bean, or wheat-straw. There is also said to be an advantage in having them drawn one or two days before they are used, in some districts, and even in having them stacked. But potatoes are thought a much better food than turnips in other parts where sheep are a great object, as being more fully and regularly to be depended on, and as preventing the diseases to which the animals are liable in a more effectual manner. The Swedish turnip come into use the latest, as in the early spring.

It is stated in the Corrected Agricultural Report of the County of Suffex, that general Murray fed 5000 sheep with potatoes and hay, 1651 of his breeding ewes ate 51 bushels every day, giving a quart to each; and which, for 120 days, is 6120 bushels: while the Norfolk stock-farmer provides for 720 sheep, 80 acres of turnips, 16 tons of hay, 20 acres of rye. The following is the comparison of the value, &c. of the provision.

It is said, that if 720 sheep require 80 acres of turnips, 2240, the upland flock at general Murray's, will require 248 acres of turnips; but they have only 50. That if 720 sheep require 16 tons of hay, or 10 acres, 2240 should require 49; instead of which they have 120, which is 71 surplus, or, at one load and an half the acre, 48 acres. And that, if 720 sheep require 20 acres of rye, 2240 should require 62, instead of which they have none at all.

Winter food of 2240 sheep, as provided for in Norfolk.

					Acres.
Turnips	-	-	-	-	248
Hay	-	-	-	-	10
Rye	-	-	-	-	62
Potatoes	-	-	-	-	0
					320

Winter food of 2240 sheep, as provided for in Suffex.

					Acres.
Turnips	-	-	-	-	50
Hay	-	-	-	-	80
Rye	-	-	-	-	0
Potatoes	-	-	-	-	20
					150

Value of crops, as applicable to each county, without regard to the expences.

					£	s.	d.
Turnips	-	-	-	-	2	0	0
Hay	-	-	-	-	5	0	0
Rye	-	-	-	-	0	10	0
Potatoes	-	-	-	-	4	0	0

Expences. Norfolk.

					£
Turnips	-	-	-	-	496
Hay	-	-	-	-	20
Rye	-	-	-	-	31
Potatoes	-	-	-	-	0
					547

Expences. Suffex.

					£
Turnips	-	-	-	-	100
Hay	-	-	-	-	160
Rye	-	-	-	-	0
Potatoes	-	-	-	-	80
					340

Which is, it is said, a difference of 63 per cent. This vast difference is to be attributed, it is supposed, in a great measure, to the distinction between the breeds of the flocks, as one being the Norfolk, and the other the South Down, as all the circumstances are in favour of it; but it may be partly owing to potatoes being a cheaper food than turnips. As to the feeding of sheep with potatoes, however, it is, though ascertained on the above farm on a very large scale, a more disputed and doubtful circumstance; and for this reason, they are allowed, stinted, or limited in their consumption, which is not the case with turnips: these, on the Norfolk farm, are fed off on the land, and, of course, in the greatest plenty. The other accidents and objections to which they are constantly liable, are also not to be overlooked: while potatoes are a regular certain crop, and subject to few accidents or inconveniences. When these circumstances are therefore well considered, in the pinch of a severe season, it will be readily agreed that the introduction of this root, and the proof of its advantage by the above extensive trial, as a winter and spring provision for sheep-stock, is really important.

The quantity of a quart every day of this root for each sheep is probably, however, much too small, as in fattening them with it in suitable yards for the purpose, a far greater quantity has been found necessary. But lean sheep certainly do not require the same proportion for keeping them as is requisite in the fattening system, as may be seen below, in speaking of that sort of management.

Cabbages, as a food for sheep, are of great importance and utility in many situations, particularly in those where the land is suitable for raising them, though it may not be of the very rich quality. They are of vast service in carrying on improvements in sheep husbandry, and as the means of keeping a greatly increased flock, where good management is followed.

The artificial grasses, such as ray-grass and red clover, are of much consequence as spring food for sheep; the first is early, and comes in after common turnips, when much wanted. It may be cultivated to advantage when the latter will not succeed. The clover comes into use in this way at a later period, and on stronger descriptions of land. Many other grasses of this sort, as well as some of the natural grass kind, might be very beneficially grown in this intention, as the cock's-foot in some cases, sainfoin, &c. on soils of the calcareous kind, and some of the poas and alopecurus, in other circumstances; by which means earliness, quantity, and quality of keep might be secured.

Tares,

SHEEP.

Tares, rye, and cole, are in great request as spring food for sheep-stock, the first being raised on the stronger sorts of land, the second on such as are of a lighter quality, and the last on many kinds, even the hilly calcareous sort. They are all sufficiently early for being fed in April, or the following month, when turnips are done. Spring tares are likewise often put in to be fed off at the close of the autumn. These practices answer very well; but mixed crops of tares and rye never do well for the purpose of sheep-feed; as they do not by any means come well together, of course there is much loss. These and other mixed crops are, however, frequently had recourse to in this sort of management, with evident benefit.

The stubble turnip system of food is very good in this sort of husbandry, for late spring or other feed; where crops of such kinds take well in succession to those of other sorts.

The plan of preserving after-grass for the purpose of sheep-feed is certainly very useful, especially for the support of ewes and lambs in the early spring. It provides well for the time of scarcity.

The practice of converting young wheat crops to spring sheep-food is seldom good. It is mostly the business of necessity and want of forecast in the sheep manager. On light and dry lands it may occasionally be useful, but it often does much harm.

Winter barley, and some other sorts of crops, have also been tried as sheep-food, but hitherto only by particular individuals on a small scale.

Whatever the nature of the food which is raised with this design may be, it should always be provided in ample abundance to the quantity of sheep-stock which is to be kept, as no sort of pinching ever answers any good purpose in this management. Good water should likewise be constantly attended to in this practice.

By thus cultivating proper quantities of proper sheep-food in connection with the keeping and managing of flocks of this sort, many important benefits and advantages would necessarily result, a far greater quantity of sheep would be kept on the same extent of ground, they would be preserved in a much better state of condition, and they would be in a much more desirable situation for the purposes of breeding or being fattened, and consequently be in every way greatly more profitable to the sheep-farmer; while the growth of such sorts of food would prepare admirably for grain crops, by which little expence would be incurred. Besides these, it would contribute in several other less important ways to the benefit of the flock-farmer, in many cases and situations.

And it is observed that, by the means which have been stated above, the sheep and lambs are capable of being continued in good healthy condition, a matter of great consequence to the flock, until the period of turning on the pastures, when they should be separated, where the lands are inclosed, into proper divisions, in proportion to the quantity each pasture can support, care being taken not to over-stock the fields, though hard stocking in some cases may be beneficial. With some farmers they are put upon the richest pasture of the farm, while with others it is the custom to let them have those of the inferior kinds. This must depend much upon circumstances; but whatever mode is adopted, the point of having the flock preserved in good condition is never to be lost sight of. It is advised, that in keeping sheep on inclosed pastures, particularly where the lands are much occupied with wood, constant care is necessary, in order to guard against the mischief of the fly, as its effects are often irremediable in the course of a very short

time in such situations, if not attended to, in hot seasons. With the view of fully guarding against this insect, a very frequent and particular examination must be made by the shepherd.

Further, on this subject it may be noticed, that the next circumstance in the management of these animals is that of weaning the lambs, which is a business that should be effected when they are three or four months old, as about July, but it is done more early in some districts than in others. And to effect it in the best and most beneficial manner, a proper reserve of some fresh pasture grass, where there may be a good bite for the lambs to feed upon, should be had recourse to, as it is of much consequence that an ample provision of this sort be had, in order that the growth of this young stock may not suffer any check on being taken from the mother. Where they have been continued so long as to graze with the dams, little check will be sustained in their separation, if turned upon such good feed. Some advise clover in blossom as the most forcing sort of food in this intention, and with others sainfoin *rouen* is highly valued for the same purpose. When good feed is not provided, of some of these kinds, the lambs soon decline in flesh, or in the technical language of the shepherd, the flock are said to *pitch*; and when once this happens, they never afterwards thrive so well, however good the management may be. With regard to the ewes, they should be removed to such distant pastures or other places, as that they may not be heard by the lambs, which would cause them to be disturbed in their feeding. And where the ewes sustain any inconvenience from their milk, as by their udders swelling, it should be drawn once or twice, as by this means bad consequences may be prevented. And as soon as the lambs have been removed, the ewes are returned upon the pastures destined for their summer support. There is, however, one caution to be attended to in first turning the lambs upon rich keep, which is that of letting them be in some degree satisfied with food previously, that they may not be surfeited by too quick and full feeding, and *heave* or *hove*, as it is termed; keeping them gently moving about the field has also been advised in this intention. In some places where the lands are of the more poor kind, it is a custom to send the lambs to the more rich vale or marsh districts, to be brought forward in condition, or fattened. In those cases, where the lambs of the male kind are reared on the home lands, as wethers, they are usually restored to the flock in the latter end of the year, but which is not by any means a good practice, as they often suffer for want of proper keep in the winter, and lose what they had previously gained in growth and condition.

And in the usual management of sheep-flocks, it is the common practice to remove a certain number of the old ewes or crones every year, replacing them by the best lambs, in order that they may be kept up in the greatest perfection; it is, of course, a matter of considerable importance to have this done in a proper manner. And in almost all the sheep districts in the southern part of the island, this selection, or *setting of the lamb-flock*, is performed about August, at which period the fairs for the sale of lambs mostly take place. And as at this time the whole are collected together for drawing into different lots, it is a very suitable period for selecting or choosing those that are to supply such deficiencies in the breeding flocks. In his Calendar of Husbandry, Mr. Young has well remarked, that in making this selection, the farmer or his shepherd usually (whatever the breed may be) rejects all that manifest any departure from certain signs of the true breed: thus, in a Norfolk flock, a white leg, and a face not of a hue sufficiently dark, would be excluded,

SHEEP.

however well-formed; in the same manner a white face on the South Downs; in Wiltshire, a black face would be an exclusion, or a horn that does not fall back; in Dorsetshire, a horn that does not project, &c. &c. And where the produce is annually fold lean, there is, he maintains, reason in all this; for customers who have been used to and prefer certain breeds, as having paid them well, are apt to be fastidious when they purchase. Some farmers in this selection look chiefly at size, always keeping the largest frames; but this is probably erroneous, unless they keep very high. It connects with a question by no means ascertained, whether sheep do or do not eat a quantity of food proportioned to their weight? In general it is a safer rule to choose a well-formed lamb, or that indicates the probability of making a well-formed ewe, rather than to select for size. The attention that is to be paid to wool in the breeds that produce the carding sort, will depend on the price to be received: if the farmer lives in a district where the price of the year is given equally to all flocks, there is little encouragement to lessen quantity for the sake of quality; retaining, however, in idea, the fact that both are attainable, that it is very common to see coarse *breeched* sheep with light fleeces, and those of a fine quality heavy in weight. The Spanish fleeces, which are finer than any other, are heavier than those of our finest woolled sheep. With combing wool the importance of the fleece depends still more on price; we have seen it at 8s. a tod: and it has lately been 36s. Quality is of very little consequence indeed, compared with quantity; and when wool sells high, no prudent breeder will set his stock without being governed considerably by this object. And it is added by the same writer, that the high prices at which new Leicester and new South Down rams let and sell, has opened a field of speculation in sheep-breeding. It is sufficient to remark, that this spirit of breeding, whether it shall prove durable or not, whether much money shall or shall not be made in it in future, is not what any prudent man beginning business will adventure in, but with great caution: men of such immense fortune are now taking a lead in it, and are in many respects doing it on such liberal principles, that the wisest conduct of such farmers as he may be supposed to address, is to take proper opportunities of converting their experiments to their own (the farmer's) profit. Leave the expence to them; but, when you can, convert the profit to your own advantage. In setting a stock of lambs, therefore, you may mark a score of the best, for a future ram to be picked up when opportunity offers; or, better still, to send to the tup of some ram-letter that takes them in at a reasonable price *per head*. By every year selecting five or six *per cent.* and by every year covering that number by a ram better than your own, the stock must be on the improving hand; and this may be done at a very small expence. Also at this period, besides filling up the deficiencies in the ewe-stock, the increasing or diminishing the quantity of stock usually kept, by reserving a larger or smaller number than that of the old sheep which are disposed of, is also a point that demands particular notice. Mr. Young has given the following useful directions on this subject, in his Calendar of Husbandry.

On a farm, says he, with a given stationary sheep-walk, it is probably regulated by circumstances that rarely change; but on inclosed farms, where the sheep are supported by fields alternately in grass and tillage, variations may easily be supposed, and the question of hard or light stocking, that is of close feeding or a head of grass, then comes in to decide the number kept. If the produce or profit *per head* is looked to, the conduct to be pursued is evidently to stock lightly; but if the return is looked for in corn from fields

laid down for refreshment by rest, then close feeding is a very material point, and the number kept will depend on it. With all grasses, &c. that do not decline from age, the more sheep you keep the more you may keep, and the more corn you will reap when such are ploughed; a circumstance too important to be forgotten. But the young farmer will remember, that upon this system he must not have a *show* flock, or let the variety of a farm have the least influence with him: if in this way he will have a something to talk of, a score or two of pampered favourites, the fewer the better, for they may cost him more than they are worth.

And as soon as this has been properly executed, the ewe and wether lambs that are left are mostly sent to the neighbouring lamb-fairs to be fold off. But where the fairs for this purpose happen later than the above period, as in the beginning or latter end of September, as is the case in some situations, it has been advised by the writer first mentioned, that great care be taken to keep them in forcing food, as in spring tares, early sown rape, good grass of the right degree of bite, &c. &c. in order to promote their growth and increase their value; but to sell in August is more beneficial.

It cannot but be obvious, that in the management of breeding flocks, the lambs come to be disposed of at different periods; first those that have been suckled or fattened in the house, in which system of fattening, much attention is required to have them early, to their being well, regularly, and very cleanly kept and suckled, as well as to the ewes being of the right sort, and the best milkers that can be provided, and to their being fully supplied with food of the most nourishing and succulent kinds. Their tails and udders should have the wool well clipped away from them in order that they may be preserved in a perfectly clean state. The lambs also require, especially towards the close of their fattening, to have regular supplies of barley, wheat, and peas, meal ground together in combination with fine green rye hay, &c. See LAMB-Suckling.

And as soon as these have been fold off, the lambs which have been fattened on the best grass-land will be ready to succeed them at the markets, in the spring and summer months, and these will be followed by the sale of the store-lambs at the different autumnal fairs.

Further, there are different local practices also adopted in different counties, to suit the particular methods in which their sheep husbandry is conducted, as well as the particular objects of it. The following is given as a hint from Sir Joseph Banks, by the writer of the Lincolnshire Agricultural Survey, on the sheep system of that extensive district: that as tups are there always hired by the breeders, the lambs may be said to be purchased before they are born; a year's credit, however, is given on this occasion, they are not paid for till the actual value can be fairly estimated; if, therefore, any one who has hired a tup at a considerable price, finds the lambs he has got not sufficiently above the ordinary sort to pay him the difference, with interest, he complains to the tup-man, who generally views the lambs with him, and makes a fair abatement, which is generally settled in the price of the hire of the next year's tup; this regulates the price of letting, and makes the tup-men a most useful set of people. The great mass of breeders in Lincolnshire sell their heeder lambs about old Michaelmas time, or a little after: a succession of fairs for that purpose are held in a village called Partney. These lambs are re-fold in the spring at Lincoln fair, under the name of hogs; at Midsummer their owners clip, and then winter them; the succeeding spring they are carried to Boston, where, in a long succession of markets, they are sold to the graziers, with their wool

SHEEP.

wool on, under the name of shearlings, and immediately turned into the marsh to fatten; the graziers take their fleeces, and having wintered them, get the kindliest to Smithfield in the course of the succeeding spring; those that do not fat so easily, yield the grazier a fleece at Midsummer, and are got off the ground in the course of the next autumn. Here you see a combined system of sheep agriculture, for as the animals are eternally either changing hands or yielding fleeces, they make a return of some kind or other to their owners, nearly half-yearly from the time of their birth, to that of their final dissolution at Smithfield. See RAM.

In the sheep system of management which is practised on the large rich tracts of the Romney, Walland, and Denge marshes in the county of Kent, there is also a local peculiarity and difference which is worthy of notice. The usual practice with the lambs in these marshes, is that of sending them about the beginning of September to be kept by the neighbouring upland or hill farmers during the winter. They go in separate lots, being received at certain appointed places by the farmers, and driven to the houses, or taken to the farms by their servants. They are then commonly put upon the stubbles or *grattons*, as they are called; but in some cases they have also pastures to run upon, though too little attention is, in general, paid to the changing of them, by which they suffer much, and are often greatly injured, especially such as are weakly and delicate. Much advantage would probably be gained by having them put, in separate lots, in different fields, and by giving them in wet seasons, once a day, some sort of dry food, such as hay, or those of better kinds in particular cases. It is not improbable, indeed, that lambs might be safely kept in these marshes through the winter, by the use of such food and proper care. It is found that there is a prodigious benefit in keeping the lambs in winter, in such situations, in having the grounds dry and warm, instead of being of a cold, wet, clayey nature. Lambs should by no means be stocked along with the ewes, as the old sheep will constantly take the feed, and *fence* the land, by which the lambs may be greatly hurt. They should always be stocked separately, and the pastures be frequently changed, circumstances which are little regarded here. Some think that lambs do not thrive well on being put to graze, after having been fed on luxuriant food, such as turnips, old tares, rye-grass, &c.

The price of the keeping of lambs in these cases is very different; some paying only 4s. 6d. the lamb, while others pay 5s.; and where no neat flock are kept, they charge as high as from 6s. to 6s. 6d. the head, for the space of about six months. This is but a late advance; however, it makes the price of keep a serious object. The loss of lambs in this system of winter management, is occasionally considerable, but depends much on the nature of the season, as to mildness or severity, amounting in some cases to four or more in a hundred.

The tegs, or one-year old lambs, in this system are brought from the uplands, where they have been wintered too often in a low state of condition, for the supply of the marsh graziers, which enables them to keep more ewes and fattening-sheep on the marsh lands. This is done about the beginning of April, when the upland farmers are indulged with a feast or treat at the expence of the graziers, as a recompense for their care and attention to the lambs, in which liberality has a great effect. As the flocks reach the marsh, they are put upon the poorest pastures, at the rate of five to the acre, their old sheep being just fold to make room for them. These are commonly the best conditioned tegs, in which there may sometimes be loss from the

sudden transition from poor to too good keep, though they are not, in general, so subject to some sorts of disease as the old ones, on such changes being made in their food.

The marsh sheep-graziers have lately been much in the practice of prevailing on the farmers to keep such flocks a fortnight, or even double that time, on turnips, which has the advantage of enabling them to double the stock on the same pastures during the summer; while on the other hand, it is evident, that when they are so hard stocked early in the spring, they can neither have so luxuriant a growth, nor be so full of graze. The pastures are likewise eased gradually, as the fat ewes or wethers are taken off, and their places supplied by the wether-tegs, while the ewe-tegs are suffered to remain on their original pastures, until they are selected, or set for going to the rams.

In the ewe management of the marsh system, which is by no means well regulated, the ewe-tegs, one-lamb, two-lamb, and three-lamb ewes, are all mixed together, so that they cannot be distinguished by the grazier, as they are not marked until turned off for fattening. A better and more convenient way would, however, probably be to keep the different kinds separate as much as possible, as many advantages would result from it. In winter the land is stocked in proportion of from two to three ewes on the acre, as it may be of a more or less good quality, and in summer with from three to four and their lambs. In case of twin lambs, with not ever more than three to the acre upon the best pastures. The summer stocking with ewes is here supposed to have too much uniformity in it, though it may perhaps be proper in the winter, yet when that season is mild more might certainly be kept than under the contrary circumstances, for which no sort of allowance is made. It is conceived, that it would be good policy, when there is the probability of plenty of keep, to increase the number of ewes on the breeding pastures, though there should be a necessity, on that account, to provide an additional pasture field or two; however, so prejudiced are many sheep-farmers in favour of the common practice, that they do not even make the necessary additions of stock to keep the graze properly under, by which means it is apt to become benty, the pasture injured, and considerable waste sustained. The old sheep, or those which have had the third lamb, are commonly cast off for fattening, and the others marked for stores, and weaned from their lambs, by putting them into one of the pasture fields for some days; which not only improves the field, but prevents the ewes from receiving injury by the flow of milk. This is a practice which in the marsh management is termed *bleating* the ewes. Some reject this mode, and put the ewes immediately on the fattening ground, from the conviction that more injury is likely to ensue by keeping them in a starved condition, for even a short time, than by throwing them at once into fresh keep. Whichever of these is the most eligible practice is not attempted to be decided, but the most general one is that of bleating: aged sheep are not so liable to be struck with disease as young ones in such cases, or the season of the year so favourable.

The system of the marsh for the management of the wethers, and the time of drawing them for the market, is this: the wether-tegs are in the general practice put upon the fattening land for the winter about Michaelmas, in the proportion of from two to three upon the acre, as may suit the designs of the grazier. Those who intend to keep them for a whole year, commonly put three on each acre of the best pastures for the winter stock; but those whose intention is to make a second or third return, are satisfied with two on the same extent; in which case, however, it is necessary that they be put more early upon the land, in order that they

may

SHEEP.

may get properly fat before winter, and go off sufficiently early, which would otherwise not be the case. The latter method is thought unquestionably to be the most profitable; but those who have not a sufficient supply of summer pasture, conceive that it will pay them better to keep three to the acre, in barely a thriving state, and fatten them in the following spring and summer. However, though they may continue to increase in size, it is most likely they will not be of more value at Michaelmas than they were in the spring; so that there is a clear loss of the whole summer keep: as mutton may often sell for 6*s.* or 7*s.* the stone in the spring, and not bring more than from 4*s.* to 5*s.* at that period in the autumn. It has been long a question, whether other sheep or old barrens fatten the most quickly, on which it may be noticed, that any increase in the food of full-grown sheep must have a tendency to the formation of fat, whereas in wethers or other young sheep, it must be partly expended in the evolution and development of their frames, and, of course, less fat be produced. Much, however, will depend upon the size and disposition of the sheep.

There is great difference in the practice of different graziers, in regard to the time and manner of drawing the sheep for the market, some beginning much earlier than others, though the sheep were all put into the fattening pastures at the same time. Some draw the worst of the sheep first, conceiving that the prime sheep pay the best for keeping; while others send them to market as they get fat, by which means, time is given for the advancement of the more common ones. Which of these methods is the most to be preferred, it is not at all attempted to determine; but the sending of inferior mutton to market, it may be remarked, is only giving it away, while, on the contrary, the retaining of such sheep as are deficient in disposition to fatten, is a complete loss of the keep of them. Towards the end of the summer, keep, however, is of but little value, and, of course, their remaining a little longer is not of any material consequence. It is therefore thought, perhaps, the best not to part with them until the approach of autumn, when inferior mutton often sells well in the vicinity of the marsh, or to dispose of them to lamb butchers at a somewhat reduced price. This inconvenience would, however, be much removed by a better and more proper selection of the sheep than that which at present is the case.

In sending the sheep to market, care should be taken to have them as nearly as possible of the same size and condition, as a few inferior ones are apt to lower the value with the butchers. In this intention they are by some divided into two or three lots, while others send them in one only; the former, however, in general obtain the highest prices. By more attention to the regulation of size and keep, a greater equality would be met with in the wether sheep on the fattening pastures of the district than that which at present prevails.

In the system of these marshes, the ewes which are designed for breeding ram-lambs from, are selected and drawn before the *riding* time, as directly upon the weaning season, or a few weeks previous to giving them the ram; there being great differences in the forms and sizes which are thought the best calculated for this purpose, in the notions of different graziers; some preferring large, others middling sizes, while many esteem most, such as have long legs and bodies. There is here, however, much too little principle in the management of this business. Such ewe lambs as come from ram-lamb ewes, should be so marked as to distinguish them, and be constantly preferred for breeding ram-lambs from. The ram-lamb ewes are mostly lambed by themselves, and have superior keep. Those which do not suit the intention

of the grazier are castrated; while such as are to be saved have a small part of the tip end of the scrotum cut off, and two marks fixed upon them, one on the shoulder and the other on the hip; being constantly indulged with the best fattening keep, as it is the common opinion that they cannot be too large. They are sent to particular situations on the neighbouring hills during the winter season, where they are tended with the utmost care and circumspection, having hay and turnips occasionally given them. On being brought back to the marshes in the spring, they have the run of the best pastures, being stocked so lightly upon them, as to be in every way disadvantageous to the grazing farmer. Another selection sometimes takes place from them during the summer, in which, those which do not suit are either sent to market, or *netted*, while those which are approved are employed in the ensuing riding time. These young rams should only have a few ewes, as thirty or forty; as more greatly injures their growth, &c. They are usually sold or hired out, by which much money is often made.

It is the practice here to keep too many rams together in the same pasture, as much loss is sometimes sustained by it. The usual time of putting the rams to the ewes here is about the middle of November, though some prefer a month, and others a week or a fortnight sooner, as their notions may be in regard to the conveniences of lambing and other matters. A week or two before the riding time the ewes are prepared by being put into the larger fields; only one ram being admitted in each, unless it be so large as to stand in need of two, when with the old ram a young one is admitted. This management prevents fighting and all inconveniences of that kind. The rams commonly remain with the ewes a month, care being taken that they perform their business properly; some change the rams occasionally, as after the first fortnight, and at other times according to circumstances. Sixty ewes are usually allowed to an old ram, and thirty to a teg ram in this marsh system. See *STOCKING Land*.

It may be observed that there is some difference in the method of managing heath, down, and mountain flocks of sheep, from those which are pursued on the inclosed pasture lands, though in the selecting and providing the rams and breeding stock, the same practices are followed by the best sheep-masters. The principal difference consists in the manner of keeping them, by putting them as early as possible in the spring months, as in the beginning of April, upon the downs, heaths, and commons, and keeping them upon them until the approach of the autumn, as the beginning of October; the fine soft sweet herbage in these cases preserving them in a state of tolerably good condition. And where it begins to grow scanty and decline in goodness, other sorts of feed which have been previously provided are had recourse to, such as turnips, cole, &c. on which they are folded during the autumn and winter till consumed, when hay which has been stacked for the purpose in such situations, is employed until the grass has again advanced to a proper bite. In these cases the system of folding is generally resorted to during the whole year, in the summer and autumn chiefly on the ground in a state of preparation for the wheat crops, but in the winter season often on the stubbles, though more extensively upon the downs and pastures; while in the spring season the lands under preparation for the barley crops receive them. This system is considered as very beneficial by the farmers in those districts where it is in use. And in the more hilly and elevated situations in the northern parts of the kingdom, other methods of management with this sort of stock are employed. In Argyleshire the principal circumstances attended to by the most intelligent sheep-farmers are these: to stock lightly, which will mend the size of the sheep,

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SHEEP.

with the quantity and quality of the wool; and also render them less subject to diseases. In all these respects, it is allowed by good judges, that 500 kept well, will return more profit than 600 kept indifferently. To select the best lambs, and such as have the finest, closest, and whitest wool, for tups and breeding ewes, and to cut and spay the worst. To get a change of rams frequently, and of breeding ewes occasionally. To put the best tups to the best ewes, which is considered as necessary for bringing any breed to perfection. Not to tup their year-old ewes; which, in bad seasons especially, would render the lambs produced by them of little value, as the ewes would not have a sufficiency of milk; and would also tend to lessen the size of the flock. To keep no rams above three, or at most four years old, nor any breeding ewes above five or six. To separate the rams from the 10th of October, for a month or six weeks, to prevent the lambs from coming too early in spring. To separate the lambs between the 15th and 25th of June; to have good grafs prepared for them; and, if they can, to keep them separate, and on good grafs, all winter; that they may be better attended to, and have the better chance of avoiding diseases. A few, whose possessions enable them to do it, keep not only their lambs or hogs, but also their wedders, ewes, &c. in separate hirsels; by which every shepherd, having his own charge, can attend to it better than if all were in common; and each kind had the pasture that best suits it. But in Linton, the following management, according to the survey of that district, is observed: in summer the flock is divided into three *hirsels*. In the first are all the hogs and yield sheep; in the second, the milk ewes; in the third, the lambs. In winter they are kept only in two *hirsels*. In the one are the hogs, in the other the ewes and yield sheep. The lambs are weaned about the end of June, the ewes milked from the 1st of July to the middle of August, and the milk made into cheese. The sheep are clipped from the end of June to the end of July, according to the weather and condition of the flock. The tups are let to the ewes from the 15th to the end of November, according to the situation of the ground, and the nature of the grafs. From 40 to 50 ewes are allowed to one tup. The breeding stock is changed every five years, by selling off the superannuated ewes. Some ewes, however, are kept longer than five years, and some shorter, according to their condition; for they do not all decline equally soon. In East Lothian, sheep are in much esteem, and kept in considerable numbers every where, especially on the coast lands. Permanent flocks, however, and regular sheep management, may be said to be almost confined still to the higher parts of the country. In the low country they are kept chiefly to eat the turnips, and sometimes fown grafs, which is permitted to lie a year or two for pasture. Flying flocks therefore are generally kept, and as soon as they are fattened for the market, which is usually within the year, they are sold off. A considerable number of lambs likewise are reared, only so far however as to render them fit for the butcher, or to be sold fat. But as the great object, in the lower districts, is feeding, little attention is paid to particular kinds; every farmer keeps those which he thinks are likely to pay best for the food which they consume. The black-faced, or Tweeddale breed, are most generally preferred for feeding on turnips, because they are most esteemed in the market; but many of the Cheviot breed are likewise kept, and even some of the improved Leicesters.

It may be noticed that it is, however, only in the Lammer-muir district that sheep husbandry can be said to be regularly practised, the management of which is this, according to Mr. Hay of Hopes. All store-farmers of any

extent keep two flocks, *viz.* one of ewes, and another of yield sheep; and this flock they sometimes divide, and have a flock of what is called *hogs*, that is, lambs of one year old. The common practice is to fold the ewes upon a break of arable land, during the summer: they cut the lambs about the 26th of May, and they wean them in the first week of July, and then they shear the whole flock. The lambs, after weaning, are sent to a healthy pasture, called the *birn*, which has been kept for them, where they remain till the end of August; when they are moved down to the best low pasture; called the *hog-fence*, which has been saved from the weaning; and here they remain during the winter. The ewes are milked for about eight weeks after the weaning, and sometimes longer, and then are put out with the lambs into the *hog-fence*, for the winter. All the sheep are smeared, that is, salved, immediately after the harvest, at the rate of two pounds, tron weight, of butter, to a Scotch pint of tar, which salves from six to eight sheep, at the expence of about five-pence each. The wool sells at from five shillings to eight shillings *per* stone, tron weight; and usually takes from six to eight fleeces to a stone: so, deducting the expence of salving, the net proportion upon the wool may amount to from eight-pence to ten-pence *per* head, sometimes a little more or less, varying according to the price of wool. Upon dry heathy grounds, the ewes are drafted, and sold to graziers, in the month of March; but upon wet grounds, which are dangerous, and subject to the distemper called the rot, they are drafted and sold in October. Few store-masters (tenants) in Lammer-muir breed as many sheep as keep up their flock; so they have to buy yearly a parcel of hogs, which are mostly wedders. Linton, in Tweeddale, is the great market for these wedder hogs. These wedders they keep for two years, and sell them to the feeders. Some of the most judicious store-masters have totally given up the practice of milking the ewes, after weaning; and others milk for a shorter space than formerly; and they now allow the lambs to suck longer, which considerably increases their bone, and is thought not so pernicious to the ewes as the milking. This practice, however, still prevails in Wales; the cheese made from ewe-milk being highly esteemed, such milk being said to be four times as rich as that of cows. The sheep are stated to give a quart of milk *per* day each, and being milked three months, the return is stated at ten shillings *per* ewe.

It is also further stated by the writer of the above Report, that the method of managing the arable land in that district has been changed much for the better, within these few years. When in grafs, it is folded; and when taken up, it gives three crops; and is then fallowed, and sown out, the first crop with grafs-seeds; and they generally follow the same practice with the new grounds taken in by fallow and lime, which has now become a general practice through Lammer-muir; and lime, when applied to dry ground, is certain of making a lasting improvement upon the grafs, which is, and always ought to be, the great object upon store-farms. However, since this account was given, much improvement has been made in this sort of husbandry, which is now carried on in a very systematic manner, it is said.

It is worthy of notice, that the practice of *smearing* or salving is now, even in these situations, much on the decline; and in the more southern parts of the island, not at all employed. See *SALVING of Sheep*.

In the sheep districts, in the more elevated and exposed northern parts of the island, a still inferior practice is had recourse to; the sheep being mostly left to provide for themselves, even in the most severe and inclement seasons, when

SHEEP.

when the bleak tracts on which they live are deeply covered with snow. According to the writer of the Perthshire Agricultural Report, in these cases the sheep have their chief dependence for subsistence on their own habits, which lead them to remove the snow by their feet with great facility, till they reach the heath or withered herbage. But when the snow is falling, or blown by a storm, the shepherds drive their flocks, without intermission, round the top of a hill in a circle, in order to keep them from lowering, and being drifted up or smothered. It has been the practice, in some districts, to erect a sort of circular folds on the tops of low hills, for the same purpose; and when the heath is all covered, they sometimes rake or harrow the snow, in order to bring up the heath, with a sort of long-toothed rake or small harrow. With some sheep-farmers it is the mode to have recourse to feeding with hay, or unthreshed oats, which is deposited in handfuls upon the snow. Mr. Marshall has suggested, that cultivating plots of furze, broom, juniper, &c. by sod-burning, and rippling the surface, or by other more eligible means, could not fail of proving beneficial upon the wintering grounds of a sheep-farm. By means of these, as a resource in the deepest snow, when the herbage of the *braes* was buried too deep and too evenly to be uncovered by the scraping of the sheep, by keeping the most exposed part of the *braes* in full herbage for less general coverings of snow, and by reserve of rape for the season of lambing, even ewe-flocks might be supported through the winter with some degree of certainty, without dry fodder, and without being left to the uncertainty of the seasons, and the mercy of the winds and weather, as they are at present.

The practice of *birfelling*, where no more lambs are kept than what is necessary for drawing the stock, is now much objected to by some, though it may be beneficial in rearing wether hogs; as they are found not only to do much better, when at large with the ewes, but there is much less destruction of grafs by trampling, and the pastures are fed down more properly, and with less injury to, and loss of, the sheep. Besides, the sheep thrive better, and are kept in far better condition, while much less herding is required, by which there is a considerable saving of expence.

There are several different modes of rearing the lamb hogs in these situations; as by laying them, when lambs, upon a certain part of the ground, and keeping them separate from the old sheep, through the whole winter and spring, until they are clipped; and then blending them again with the old sheep, putting more lambs upon the same ground, &c.; by allowing the hog lambs, when gimmers, to remain upon the same land on which they were bred, and breeding the hogs on a different part of it, and continuing them on that also until they are gimmers or dinmonts, and then introducing them among the old sheep, the lambs being every year laid on the land where such gimmers or dinmonts had been the previous year; by keeping the hogs and dinmonts or gimmers together, and putting the gimmers or dinmonts only among the old sheep, and the lambs among the hogs, in the same place, &c.; and by breeding the hogs among the old sheep. The three last of these modes of management are supposed the most useful, but the last the most powerful in preventing disease; though the first and second probably afford the most equal stock of this description, in such exposed situations.

Profits of Sheep-Management.—It is evident that there is a variety of circumstances in the practice of sheep husbandry, that must affect any statement that can be made, in respect to the profit that may be derived from it: the nature of the system of management pursued, and that of the breed of

sheep employed, must operate so much in this way, as to leave the profits of no two sheep-farmers scarcely the same. But our limits will not allow us to introduce any particular statements on the subject.

In all sorts of sheep-grazing management, it should be the constant aim of this kind of farmer to have his pasture or other land so stocked and provided, as to derive the greatest possible profit from it; as where this is not the case, he not only injures himself, but the whole community. Where systems and practices of this nature are followed, which are not sufficiently profitable, they should be given up, and changed for such as are more fully beneficial. The same plan cannot, however, be always equally productive of advantage, as the fluctuation in the value of stock in different places, and from the ease or difficulty of providing it, at different times, as well as the nature of the season, must be the causes of much diversity in it, which are invariably to be well attended to by the sheep-grazier, and turned as much as possible to his own account. See *GRAZING, and STOCKING Land.*

The practices and profits of different sheep-grazing farmers are often very different in the same situations, as scarcely any two farms of this kind are conducted exactly in the same manner for the whole of the same year, or probably the same farms for two succeeding years together; as farmers of this sort must be directed and regulated in their management by times, circumstances, and seasons, so as to have their lands stocked according to the growth, or the probability of the growth, of grafs on them; taking care to have them always provided during the early summer months. Peculiar local circumstances, and the difference in the conduct and management of individuals, as well as capital, may also have great influence on the profit. On these grounds, the ordinary profit may amount, in favourable cases, to one pound the acre, and from that to two or three, as they are less or more favourable. The difference of practice which is had recourse to, as it relates to the sorts of sheep-stock, may likewise further increase it.

The employing sheep-stock wholly is probably the most profitable plan of all others, where such stock can be readily and reasonably procured, at all times, in the lean state; but which is not always the case. And where the grazing farmer, as in the Romney-Marsh practice, can either send them readily to the uplands for the winter, or feed them on turnips, and have their lambs well kept, and send out a sufficient number, as well of them as of the tegs or two-years old sheep, or render these last fat, as is sometimes the case, a greater profit, it is said, will be produced than in other ways. The value of the wool is likewise to be taken into consideration in this sort of stock, as it tends to profit.

The profits of the breeding system, in the above marsh, with sheep, depends much upon the qualities and properties of the lands for the purpose, as some will carry and keep a far greater number of them than others; as two to the acre, two and a half, and three on the same extent of ground. It is unquestionable, that by lightly stocking such lands in the winter season, the growth of the summer grafs would be greatly benefited; but 100 acres of such breeding pasture land, which keep only 200 sheep, producing 220 lambs, will not pay so well, it is thought, as if 300 ewes were kept, producing 340 lambs. Two returns, therefore, are not capable of being made in the breeding system, as many ewes are, of course, under the necessity of being kept in the winter time as such lands will support. It is, however, suggested, that by the use of hay and artificial food, much increase of profit might not only be produced, but such

SHEEP.

such pastures be improved; which should be the constant aim of the sheep-grazing farmer, whenever the expences will allow of it. Further, the expences of labour and keeping such pasture-lands in proper order, losses of stock, &c. must take greatly away from the profits of this kind of farming. It is, on the whole, thought, that though the profits of the breeding system may fluctuate considerably, it will not be so great as in some other modes of sheep-grazing. The breeding sheep-farmer may, it is said, "have a large or a small crop of lambs; he may lose a great many, or only a few ewes. There may be an increase or decrease in the value of the lambs, old sheep, or wool; there may be a prolific or scanty crop, an increase or decrease of rent; which circumstances cannot fail to alter the profits of a breeding grazier." But that lately, for many years, the great demand for lean sheep and wool has contributed greatly to the profits of farmers of this kind. The profits and advantages of the fattening system of sheep management, which is more varying, will be afterwards particularly considered, and in some measure compared with the breeding practice.

The original differences in the value of lean sheep, for the purposes of the breeding sheep-farmer, and as they may happen to be in a better or more reduced condition, must have a further effect on the profit of this system of management, as often amounting to not less than from three or four to eight or nine shillings the head.

Fattening-Management of Sheep.—In the business of fattening store sheep, there are many circumstances that should be carefully attended to, as well as that of managing the breeding and other flocks. The kind of sheep that are most advantageous under the different sorts of keep, situations and kinds of land, must be well considered: the differences in the sorts of food, in regard to the improvement of the sheep; and the most beneficial methods of employing it in different cases; and lastly, the markets. And as the sheep under this treatment should never be suffered to have any sort of want of fresh food, they should never be kept too long upon any inclosure or grafs-piece, or any other sort of keep, so as to be compelled to feed upon the fullied or trampled food, as it always greatly retards the fattening of the animals, or what is termed proof, which is constantly the most promoted by the allowance of only the prime fresh food.

There are many different sorts of food made use of in this business, such as the different sorts of turnips, which are very extensively applied in this system, and some use them alone; but it is probably a better practice to give some sort of dry food with them, especially where the common turnip is employed, as it is more watery and less nutrient than that of the Swedish kind. Cut hay, chaff, bran, corn, oil-cake, all answer well in this intention; and of the first two or three sorts they should have a pretty full supply; but the latter, from their expence, should be more sparingly given; several pounds of oats will however be required for each sheep *per* day, according to the kind and size. It is stated in the Norfolk Agricultural Survey, lately published, that captain Beacher having 700 fatting sheep, and turnips running short, put 200 of them to oats (not ground); he found that the practice would not answer if oats were more than 6s. *per* coomb, and then not for longer than six weeks: they were fed on a pasture, and the improvement of it very great. He thinks grey pease or beans would have answered much better.

With oil-cake, some give half a cake a day to each sheep, but the quantity must depend in some measure upon the other keep which they have. All food of this sort should be given in moveable troughs, divided in the middle, so that the sheep may feed on each side, with a sloping roof over

them, so as to cover the sheep's heads and necks while feeding, as wet is not only prejudicial to the sheep, but spoils the cake. A rack for hay, fixed over the trough, might probably be made to answer in this intention, while it would be very convenient for holding that material, and preventing waste. The whole should be fixed on wheels, and be made to stand steady, and a sufficient number for the quantity of sheep be always in readiness.

Steamed or baked potatoes, cheap convenient contrivances for the preparation of which have been lately invented, have been supposed by some to be preferable to turnips as a food in this intention. And they have been employed raw in the proportion of eight or ten pounds *per* sheep in the course of the day or night; but they are certainly a much better food in their prepared state. The quantity of common turnips consumed by each sheep in the same length of time, is usually about eighteen or twenty pounds. Where this last sort of crop is good, an acre is supposed to support about five score sheep in the field, six or seven weeks in the winter season: an acre of good grafs supporting at the rate of one hundred couples from five days to a week.

In the fattening of widders, the use of barley meal, with grafs or some other sort of green food, has likewise been found highly beneficial, and when it can be procured at a reasonable rate, should not be neglected, as it is quick in rendering them fat, and the mutton is excellent.

Different other articles are occasionally made use of as the fattening food of sheep, such as peas and beans, or pea and bean meal in the winter season, and some substances of other kinds. It is not known that any sort of pure saccharine matter has ever yet been tried in this intention in sheep, but it is probable that it could not fail having the effect in a very expeditious manner, if the expence of it would allow of its application in such a way; and it might be conveniently given, in small quantities at a time, in mixture with chaff, cut hay, bran, or any other similar sort of material, in covered troughs or bins for the purpose, suitable other sorts of food being had recourse to at the same time.

On the most usual sort of food for this use, that of turnips, sheep are very apt to go backward, unless fattened out before the winter season sets in. Indeed the loss from keeping fat sheep through the winter is often so considerable, that it is advisable to have them ready to sell at the close of summer, to prevent the winter keep from being thrown away. The most beneficial application of this sort of food in fattening sheep, has, however, probably not yet been fully shewn, as some kinds of sheep are said to pay well in winter fattening.

In fattening sheep in yards with potatoes, some take them in towards the latter end of the year, and keep them until they are ready for sale about the beginning of March. They have the potatoes sliced, and put into covered sheep-troughs, a gallon being sufficient for a sheep in the day. They mostly prove well on this sort of food, so that if a fair trial be made, the potatoe system will probably be found the most expeditious of any in fattening these animals. When compared with different sorts of grain, oil-cake, &c. by means of accurate trials with sheep in every way the same, it has been proved to be the most ready in effecting the business. A little hay is mostly given with the potatoes, morning and evening. A vast mass of excellent manure is likewise raised by this practice, where due care is bestowed in the preparation of the yard. Many other substances tried in the same way, may possibly be equally beneficial in this intention, though they have not yet been made use of by sheep-farmers.

In regard to the profits of the fattening practice of sheep management

SHEEP.

management on the more rich lands of the marsh kind, they must vary much according to the nature of the methods which are pursued by different sheep-grazing and fattening farmers, as some will make their land carry nearly one-third more stock than others, though the quality of it may be the same, while such stock will do equally well, if not better. Such commonly make the largest profits as have constantly the best supply of additional sheep-stock to succeed such as are taken away, and who regard the number more than the quality of them. The fattening practice may likewise be carried further than is proper and beneficial, by which the profits of the individuals will be lessened, and a loss sustained by the nation at large. The nature of the breeds of this sort of stock will have some influence, as they make a more or less quick return, and as they may come to a more cheap or dear market. The best way in general, is to sell the fat stock of this sort when ready, without waiting, but which is not always the case. Where more returns than one are made in the year, there is commonly the most profit made to the sheep-farmer; and the practical management which is had recourse to in such cases, will have a great effect on the profits, as different rich sheep-fattening districts have many different practices, which are more or less profitable, as that of stocking the land with sheep, at the rate of three to the acre, from the beginning of one autumn to that of another, and having recourse to mixed stock of other sorts during the summer for producing the profits: that of stocking with barren ewes which have had lambs, at the same time, but only at the rate of two to the acre, so that the keep may render them in a great measure fat by the beginning of the new year, and they may be sold off in March or the following month, in their wool, so as that the advance in their price may more than compensate for having it, by keeping them on until May. And after these are gone, by again stocking the same land with sheep brought in from the markets, fairs, hills, or neighbouring high grounds, or the two-years old wethers that have been kept out, or, which is perhaps the best stock in these cases, with such tegs as have been well kept through the winter, and which are equal in weight with starved or stunted two-yearlings. This is a most profitable sheep-fattening system, where it can be carried into practice, that of putting, what are denominated made barrens, or such ewes as have missed going to lamb, upon the fattening land; but as these will not form the necessary supply of stock, other sheep or mixed stock must be provided to produce sufficient profit. It is never a good practice to turn poor lean sheep directly upon the rich fattening lands, but to keep them some time on the inferior pastures, as they are in danger of becoming diseased by the former method. But half-fat sheep may be put immediately upon them without danger, and be fed out, often in the course of two months or less, by which the sheep-grazing farmer is enabled to have another return, which may contribute greatly to his profits.

In the sheep-fattening system, it is often of advantage to have a portion of land, of a superior rich quality, for the purpose of finishing them out upon; as by such means not only more sheep can be fed out and returned, than if the regular quantity of stock was kept upon the different fields, but the less rich pastures be stocked in a more close manner, and as the more quick feeding sheep advance, be taken into the rich finishing portion.

There are several other circumstances which have much effect in this system of sheep management; but the profits will materially depend on the proportion, the richness, and the quality of the farmer's fattening to his other lands, on the judgment which he possesses in the buying in lean stock,

the nature of the season, the state of the markets, the losses sustained, the expences of the management, &c. as already seen.

Though the size of sheep is by no means a point of much consequence in the breeding practice, it should not on any account be overlooked in that of fattening.

The average profit of middling-sized fat rich pasture sheep may be stated to be from about one pound to one pound four or five, or even ten shillings, or even more in some cases.

Folding-Management of Sheep.—In the management of sheep there is a practice made use of in some districts, which remains to be noticed; and which is that of folding. It was formerly thought to be indispensably necessary to the success of the farmer in different districts; but of late a different opinion has prevailed, except in particular cases, and it is considered as merely enriching one field at the expence of another. The practice may, however, be beneficial where there are downs, heaths, or commons. The ideas of farmers are not, however, uniform on this subject, as will be shewn by the following details from the Norfolk or Hertfordshire Reports on the agriculture of these districts. In the former it is remarked, that near Brandon there is a practice, introduced about ten years ago, said to be from Kent, which is, to fold their flocks for five or six hours in the middle of the day in hot weather. And that, in laying out the inclosures of the farm at Waterden, from fifteen to fifty acres each, much attention was paid in the arrangement to have every field of the farm to open into a lane, that leads through the whole, so that by dividing the flock for stocking, according to varying circumstances, Mr. Hill can keep at least one-fourth more than when all the breeding ewes and lambs were in one flock, and the food dirtied by driving to fold: by this means there is not a bent on the farm, the stocking being equal. He is not, however, entirely without a fold: when the lambs are weaned (usually about old Midsummer) the ewes are folded for about two months, principally to prevent their breaking pasture, when the lambs are taken from them: and while thus folded, he finds that it takes one-half more land to feed them than if they were left allotted, as through the rest of the year. That folding lessens the value of the lambs he has not a doubt, and that considerably; they do not bring so high a price as others not folded. This is not opinion, but fact. The ewes are also in doubly better condition, from lying still and quiet. That the *teeth* will, in certain cases, be unequally given, he does not deny; but it is not difficult to remedy this by the dung-cart; to fold a lot in its own lay, is also a remedy, and is the only sort of folding he can approve. In regard to the effect on wool, he is clearly of opinion that folding does not render it finer, it makes the fleece lighter, but never finer. And folding is generally given up by all who have South Downs; not because they will not bear it, for they bear it better than any sheep in the island; but because the stock is so valuable that it is worth the farmer's attention to contrive, by every means, to keep as many as possible. And it is added, that one circumstance, though a small one, deserves mentioning, for the use of those who form separating sheep-pens: which is, that Mr. Hill has sliding-gates from one to the other; the writer remarked that when a pen is full of sheep, the gates cannot be opened with convenience; but by their sliding in the fence, this is avoided in a very easy manner.

Further, Mr. England, of Binham, does not fold. When not folded, he thinks, sheep do with less food; and as to the common objection, of their drawing under hedges for shelter, in storms, &c. so much the better; it is what they ought

SHEEP.

not to be prevented from doing. The *tatbe* is much more than lost in mutton. And Mr. Reeve, of Wighton, never folds: folding from layers, upon fallow, is only robbing one field to enrich another. He is clear in this point; and also in the fact, that if sheep (whatever the breed) are driven by foul weather to a hedge, there is the proper place for them, and not by penning left to abide the beating of the storm. Mr. H. Blythe, of Burnham, sometimes folds, but never from choice, but solely by reason of the openness of his farm; nor does he approve the practice. And he explained a point in his manuring for wheat, which, the writer says, comes home to the question: he never sows tempered land with wheat, without either oil-cake, or muck, except on pieces from which the sheep were not folded while feeding the layers. And Mr. Dursgate remarks, that folded sheep certainly demand more food than those which are not folded; a quarter of a ton of rape-cake is equal to the fold; and the flock, without any doubt, suffers more than that value by folding. In short, folding is to gain one shilling in manure, by the loss of two in flesh. Some, however, fold with large flocks. But Mr. Beck, of Riving, does not fold; and he is very certain that if he did fold, he could not keep any thing like the number of his present flock. It is added, that as the writer rode across a layer of forty or fifty acres, on Mr. Overman's farm, he observed a great difference in the verdure, to a line across it, the appearance of one side of that line being so much superior to the other; and on his remarking it, he was informed, that it was an accidental experiment, which was well worth attention: there was no other difference in the management, to make one part of that layer better than another, except the sheep that fed it being from one part of it folded on another arable field during the summer; but from the other part they were not folded at all, but left in the layer night and day. The difference was very considerable, and might have been discerned half a mile off. This experiment made that farmer give up folding, except when his flock was in a salt-marsh; and Mr. Tuttle, a neighbour, asserted, he would never fold at all had he no marshes. Nor does Mr. Etheridge, of Stanhow, fold. These facts should, the writer says, be combined with another, that of heaths and sheep-walks that have been fed with sheep for centuries; but those sheep constantly folded on other lands, are so far from improving them, that they are to all appearance as poor as they could have been at any former period. It is further stated, that Mr. Styleman, at Snettisham, turned his flock loose, and without folding, in twenty acres of *ollond* every night, for the same period that would have folded it in the common manner. The sheep did much better than they would have done had they been folded; the face of the herbage materially improved during the period, and upon ploughing it up for wheat the crop was equal to what it would have been with folding, and shewed by a regular verdure, that they had distributed the manure equally in every part. He conceives that lambs sell 3s. a-head lower on account of folding, than they would do without it; but this is only his opinion. He thinks also that the ewe is much injured.

But Mr. Pitts, of Thorpe Abbots, finds that no mucking, on his burning gravels, will do so much good as the fold, and especially on a white clover and trefoil layer for barley. And in the clay district of the county of Hertford, Mr. Byde remarks that sheep have been too much lessened. Of all the common manures, he considers the fold as the best; and he has observed in many farms the general appearance of the crops decline, as the number of the sheep kept has lessened. That at the Hadhams, every man folds the sheep which he keeps; a little farmer will even set four

hurdles, if he has not sheep for more. But that good as the manure of the fold is, Mr. Chapman has found by trial in the same field, for turnips, that yard-dung was much better than both fold and malt-dust together. However, Mr. Roberts, of King's Walden, thinks nothing is equal to the fold; he never reckoned it worth less than 40s. *per* acre, corn being cheap; but of late much more; he folds two poles of ground with twenty sheep. And Mr. Sedgwick, of Rickmansworth, is clearly in favour of folding on all farms. See *FOLDING of Sheep*.

It has been observed by Mr. Ellman, in the *Annals of Agriculture*, that just twenty South Down sheep (if a large fort, a less number will do) will fold one rood *per* night: three thousand two hundred will fold one English acre *per* night. We value the manure at from 35s. to 50s. *per* acre, the goodness of which depends much on the manner in which the sheep are kept; if kept on artificial food, such as tares, rape, clover, turnips, &c. they will drop more soil than if fed on grass only. Suppose we estimate the folding at 40s. *per* acre, it will amount *per* year to 4s. 6 $\frac{3}{4}$ d. *per* sheep; 22l. 16s. 3d. *per* hundred; or 223l. 2s. 6d. *per* thousand, supposing the sheep folded throughout the year. If it be a breeding flock, it might be well to omit folding for five or six weeks immediately after lambing, as the young lambs might suffer from being trampled upon, and from driving to and from fold, would often lose their dams, and suffer in that way more than if they remained quiet. There is, however, another method of folding, by which all the advantages may be attained during winter on all soils, without the inconveniences of the former plan. This is stated to be by confining them at night in a sheep-yard, well and regularly littered with straw, stubble, or fern; by which means you keep your flock warm and healthy in bad seasons, and, at the same time, obtain a surprising quantity of dung, so great a quantity, if you have plenty of litter, that the profit will be better than folding on the land. A great improvement in this method would be giving the sheep all their food (except their pasture) in such yard, *viz.* hay and turnips, for which purpose they may be brought up, not only at night but also at noon, to be baited; but if their pasture be at a distance, they should then, instead of baiting at noon, come to the yard earlier in the evening, and go out later in the morning. This is a practice which cannot be too much recommended; for so warm a lodging is a great matter to young lambs, and will tend much to forward their growth; the sheep will also be kept in good health, and, what is a point of consequence to all farms, the quantity of dung raised will be very great. If this method is pursued through the months of December, January, February, March, and April, with plenty of litter, a hundred sheep will make a dunghill of, at least, sixty loads of excellent stuff, which will amply manure two acres of land, whereas one hundred sheep folded (supposing the grass dry enough) will not in that time equally manure one acre.

And in Norfolk, Mr. Bevan finds a yard well fenced in for standing fold for littering and for folding in bad weather convenient; and is fully convinced of the great advantage of it. He intends in future to have his flock in it for yearning, whether the season be good or bad. And in Hertfordshire, the earl of Clarendon has a fold which contains good room for three hundred sheep, the number kept in it: an open shed surrounds it, except on one side, where a barn is the fence; the outside of the shed is formed of wattled hurdle-work, without straw or other materials, for coolness, left a greater closeness should make the yard too hot: it is all kept well littered with stubble, and yields, from three hundred sheep, eighty large cart-loads of manure. This system agrees perfectly well with the sheep, and keeps

SHEEP.

them more healthy than when they were left in the fields in the common manner. His lordship has another yard for lambing, which has also a shed. These sorts of yards, from their beneficial tendency in different views, should be more generally made use of by sheep-farmers in all situations. See *SHEEP-Houfe*.

This practice is had recourse to on arable land for raising different sorts of crops of the corn and green kind, as well as on grass-lands. It is supposed by some, that a flock of about five hundred sheep will be sufficient to pen twenty-eight square perches of land each night, which will amount to about fifty acres in the year, where the practice is discontinued two months in the course of that time. The value of this is different in different districts, as from above thirty to more than forty shillings the acre, which for five hundred sheep, would be from 87*l.* to 100*l.* for fifty acres, which, taking the average at 94*l.* for that amount of flock, the annual advantage of the fold may be set at 3*s.* 9*d.* a-head, or rather more; taking it at 100*l.* it would be 4*s.* 2½*d.*, or rather more. This shews the great utility of it in some places. All sorts of sheep, except the fattening ones, and those disposed to that state, are mostly folded. It forms a sort of moving dunghill, which enriches the land at but little expence, and which may probably be rendered further useful by a greater division of the flocks. It is also beneficial in preventing the waste of food on grass-lands, as well as in consuming particular sorts of crops. See *SHEEP-Fold*.

Hurdling-Management of Sheep.—It may be noticed, that the great utility of hurdling off different kinds of green crops, in consuming them by sheep, has been long known and practised; and equal advantage may be derived in many cases, by having recourse to the same method on rich grass-lands in large inclosures, so as to let the animals have a fresh space or bite every day. The sheep are found to thrive better, and the same extent of land to support considerably more in number, while the land is at the same time much improved. And it is not improbable, but that other sorts of flock may be managed in the same way with similar advantage. In these cases the hurdles must be set according to the nature of the grass; where it is bare and thin, larger pieces should be folded, than in the contrary circumstance. See *HURDLES*.

Washing-Management of Sheep.—From the fleeces of sheep becoming much loaded and filled with dust and dirt of various kinds, in the hot summer season, by way of preparation for shearing, it is necessary to have recourse to the operation of *washing*. It was formerly the method of performing this business to have the washers standing up to the breast in the water; but from the inconvenience and danger of it, the men requiring a large supply of spirituous liquors, and being liable to be attacked with colds, rheumatisms, and other diseases, as well as being apt to dispatch the work with too much expedition, so as to leave the wool insufficiently clean; it has been proposed by Mr. Young, in his Calendar, to rail off a portion of the water (in a stream or pond) for the sheep to walk into by a slope mouth at one end, with a depth sufficient at one part for them to swim; and to pave the whole: the breadth need not be more than six or seven feet; at one spot to let in on each side of this passage, where the depth is just sufficient for the water to flow over the sheep's back, a cask either fixed or leaded, for a man to stand in dry; the sheep being in the water between them, they are washed in perfection, and pushing them on, they swim through the deep part, and walk out at the other mouth, where a clean pen, or a very clean dry pasture, is to receive them; of course there is a bridge rail-way to the tubs, and a pen at the first mouth of the water, whence the sheep are turned into it,

where they may be soaking a few minutes before being driven to the washers. But other more cheap contrivances may be provided where there is clean water at hand for the purposes. And sheep should on no account be driven on dry or dusty roads after this operation.

But in all cases before this work commences, the lambs should be separated from the ewes and other sheep, and each be put in separate pens. With these it is seldom necessary to do much more than just swirl them through the water, without their being touched by the washers. As soon as they have been washed, the sheep should have a clean hard pasture for a few days, until they are perfectly dry, and in a proper condition to be shorn. The lambs are generally shorn, especially in the northern districts, a few weeks after the old sheep, and the operation is termed *shearling*. The lambs that are sold in Smithfield market are, we believe, seldom or ever shorn. See *SHEEP-Shearing*, and *SHEARLING of Lambs*.

The practice of washing the sheep before they are shorn is a custom that prevails over most part of the kingdom, especially with the long-woolled breeds, and pretty generally with those of the short-woolled kinds also, but which is performed with more difficulty in them from the close-matted nature of the fleece. It is said, however, to have been the custom in Devonshire, for a great length of time, never to wash the short-woolled sheep, but to shear them dry, as is constantly the case in Spain.

The practice of washing the sheep before shearing now, however, begins to prevail in some parts of it, according to the writer of the Agricultural Report of the county. This has at length been enforced, it is supposed, by the difference in the price which the wool-buyers make between wool in the yolk and washed wool; which is no less than 50 per cent. even in the Dorset sort of wool; and though it is not so much, it is greatly more than proportionate in the coarser fleeces, besides the over-weight of 5 per cent. The wool of the Dorset fat wether sheep, which is about five pounds each when washed in the yolk, rarely sells for more than 1*s.* the pound, but when washed, it as commonly commands 1*s.* 6*d.* The weight of a fleece in the yolk, is to the same fleece when washed, it is said, as six and three quarters to five, and the consequent value is as 6*s.* 9*d.* to 7*s.* 0*d.* the fleece. This has, at length, been made evident to the sheep-farmers of this district, who now willingly agree, that it is advantageous to wash short-woolled sheep before shearing, but to sell the long and coarse stapled fleeces in the yolk.

Good clean washing is a matter of great consequence to the wool; and it is of much advantage to it as well as the sheep to have the weather fair and fine at the time it is performed, as they are much less liable to have colds.

Shearing-Time.—In respect to the proper period of clipping or shearing sheep, it must be directed by the state of the weather, and the climate in the particular district; and by this means the danger of injury by cold, from depriving the sheep of their coats at too early a season, and from heat, by permitting them to continue on them too long, may be avoided in the best manner. But another circumstance, that should likewise be attended to in this business, is that of the wool being fully grown, or at the state of maturity; as where the clipping precedes that period, it is said, in the Annals of Agriculture, to be weak, and scarcely capable of being spun; and if protracted later, it is yellow, felted, and of an imperfect nature. It has been stated, that for the more warm sheltered situations in the southern parts of the kingdom, the beginning or middle of June, when the weather is fine, may be in general the most proper; but in the more exposed districts, in the northern parts

SHEEP.

parts of the island, the middle or latter end of the same month may be more suitable, provided the season be favourable. But with the fattening sheep in the inclosures, it will mostly be necessary to perform the work at an earlier period, in every situation; as the great increase of heat, from the setting in of the summer weather, added to the warmth of the fleece, becomes very oppressive and injurious to them, in their feeding and other properties.

It is an excellent practice with many good sheep-farmers, to clip off all the coarse soiled wool about the thighs and docks, some weeks before the usual time of washing and clipping the sheep; as by this means the sheep are kept clean and cool, when the season is hot, and with ewes the udders are prevented from becoming sore. This practice is common with some South Down sheep-masters, as well as in Yorkshire. In the former situation, Mr. Ellman sells his, as locks, at $3\frac{1}{2}d.$ per pound, having about four ounces from each sheep.

By some it has been proposed to shear sheep two or three times in the course of the year, with the view of having finer, as well as a larger quantity of wool; but it is probable that such a practice can never be of any general advantage, though the trials that have been made in Northumberland in this way seem to shew that advantages may be derived in both these intentions; but the disadvantages in respect to the sheep do not seem to have been sufficiently attended to. And with the same view, the clothing of sheep has been had recourse to. In experiments made in this way in Scotland, the advantage in respect to wool is stated to have been very considerable, and the expence not more than $7d.$ per sheep. By having recourse to this practice with that of the above, it has been suggested that combing wool may be rendered fit for the purpose of clothing, and at the same time the mutton rendered more valuable. The trials in these ways have, however, hitherto been but few, and do not seem to extend.

It may also be noticed, that in the general management of sheep, it is usual, after the shearing has been performed, to mark the sheep with red, ochre, or some similar substance; and some also cut the ear in different ways. The marking with tar has been said to be prejudicial; but where a small quantity is only employed, little injury can be sustained. And in almost all the sheep districts of the kingdom, except in Dorsetshire, the tails of sheep are shortened, which seems to be an useful practice in keeping the animals more clean behind, and of course less liable to be stricken with the fly. It has, however, been suggested in the ninth volume of *Annals of Agriculture*, that by this custom the sheep may be rendered less able to drive away the flies. The general prevalence of the practice would, however, seem to prove its being of advantage. There is much difference in the manner of performing the business in different districts, in respect to the length; but four or five inches being left, are quite sufficient. It is usually done while the animals are young. In all sheep-pastures the hedges should be well cleared from briars, as their coats are often injured by being torn by them; and all sorts of pernicious reptiles should be as much as possible destroyed, and removed from such land.

Further, in respect to the business of castrating or gelding the lambs, it may be performed any time from the age of a fortnight or three weeks to that of a month or six weeks; and in some districts it is deferred to a considerably later period. It is, however, the safest method to have it executed early, as there is less danger of too much inflammation taking place. But in all cases, the lambs should be in a healthy state, when it is done; as under other circumstances, they

are liable to be destroyed by it. The operation is usually performed by the shepherd, by opening the scrotum or cod, and drawing out the testicles, with the spermatic cord. This he often does with his teeth, in the young state of the animal. But where the operation is performed at a later period, it is usual to have recourse to the knife; the arteries being taken up, and secured by means of ligatures or the searing-iron. The business, if possible, should be done in fine weather, when not too warm; and the gelded lambs be kept in a dry, sheltered, quiet situation, for a few days, until the inflammation is gone off. If it should happen to be wet at the time, it may be advisable to have them under some sort of shelter, where they can have room to move freely about.

It is now well known that the mode of ascertaining the age of these animals is chiefly by their teeth; but they are likewise sometimes named from the number of coats or fleeces that have been shorn from them, as one-shear, two-shear, &c. The sheep of one-shear having two broad teeth before; that of two-shear, four; that of three, six; and that of four, eight; which is full-mouthed. See *AGE of Sheep*.

And they have also different names in different districts. After being weaned, the ram or wedder-lamb is sometimes termed *hog*, *hoggit*, *teg* or *tag*, during the whole of the first year; and the female lamb, an *ewe* or *gimmer-lamb*, and *ewe-teg*. The second year, the wedder has the title of *shear-hog*, or a *two-toothed teg* or *tag*; and the ewe is called a *thaiwe*, *thave*, or *two-toothed ewe*. In the third year, a *shear-hog*, or *four-toothed wedder*; and a *four-toothed ewe*, or *thaiwe*. The fourth year, a *six-toothed wedder*, or *ewe*. And in some places, from the time of lambing till that of salving, the males are called *tup-lambs*; and from that period till the time of shearing, *tup-hogs*; and ever afterwards, *tups*; the females in the same order being termed *ewe-lambs*, *ewe-hogs*, *gimmers*, *young ewes*, *old ewes*. The gelded male lambs, *castrated wedder-lambs*, *wedder-hogs*, *dummonds*, or *dinmonds*, *wedders*. *Crones* also signify old ewes; and there are several other provincial names, which are explained in their proper places, under their different heads. See *SHEEP, Names of*.

In the management of this sort of stock, it must be sufficiently evident that a great deal of the profit and advantage must depend upon having a careful attentive shepherd, who perfectly understands his business, and is at all times willing to perform it. See *SHEPHERD*.

Sheep are subject to a variety of diseases, which should be carefully attended to by those who have the care of such sort of stock, as soon as ever they shew themselves; as a very short time often renders them irremediable. The nature of them, and the means of removal, are described under the proper heads to which they belong.

The above accounts, observations, and details, may serve to afford the inquirer a general knowledge of the nature of sheep husbandry, and of the usual methods of management which are required with that sort of live-stock, as well as the benefits and advantages which may be derived from it in many different ways.

SHEEP, and their Varieties, chiefly in connection with the Woollen Manufacture, History of. Of all the animals that have been domesticated by man, none have rendered him more essential service than the sheep. A large part of the food and clothing of the civilized world is supplied by this useful animal. The culture, improvement, and manufacture of its fleece, have constantly accompanied and marked the progress of civilization, both in ancient and modern times.

SHEEP.

In the early ages of society, sheep appear to have been principally domesticated for the sake of the skin, or the fleece: we shall, therefore, first take a short view of their cultivation and improvement in different countries, as wool-bearing animals; whether as producing fine or coarse wool, or as *long* or *short-woolled* sheep; the produce of the two latter differing from each other in the mode of manufacture, and the uses to which it is applied, more than silk and cotton, considered as articles of manufacture.

It is not a little remarkable, that the domesticated sheep depends for its subsistence almost entirely on the care of man, and is never found at any great distance from his habitation. "Left to itself, it becomes the subject of disease, and the prey of ferocious animals; or if these should spare it, its own fleece becomes the abode of insects, which continually nourish themselves with its blood, and destroy its constitution. Its enemies are indeed so numerous, and constantly at hand, that it has no chance of escaping them."

Naturalists are not fully agreed from what animal the different varieties of domestic sheep originally sprung. The Siberian argali, as described by Pallas, was most probably the parent of all the cultivated flocks in Asia, from whence they have spread to other parts of the world. This animal, the argali, which in the Siberian language means wild sheep, is called by the Russians *kamenoi barann*, or sheep of the rocks, from its ordinary place of abode. According to Pallas, it is the same with the musimon of Pliny, and the ophion of the Greeks. It is found, in all its native wildness, vigour, and activity, inhabiting the vast chain of mountains which run through the centre of Asia to the Eastern sea, and the various branches of this chain, extending through Great Tartary, China, the north of Hindoostan, and Persia. The argali delights to bask in the sun on the bare rocks, but avoids the woods and shade; it feeds on alpine plants and shrubs; it prefers a temperate climate, but is found also amongst the rocks of Asiatic Siberia. This animal loves a state of solitude, and flees the haunts of men. According to professor Pallas, nothing but the surrounding sea can account for the argali being found on an inhabited island, as is sometimes the case.

The ewe of the argali brings forth before the melting of the snow: the lamb resembles a young kid, except that it has a flat protuberance in place of horns, and is covered with dark grey hair, frizzled and woolly.

There are few animals more difficult to overtake than the argali. When pursued, it turns and doubles like a hare, scrambling over the rocks with wonderful agility. Though the adult animal is untameable, the lamb is easily domesticated, when taken young, and fed on milk, and afterwards on fodder, which is proved by numerous experiments made in the Russian settlements.

The argali is about the size of the fallow deer, but its make is more robust, being less elegant than the deer, and its neck and legs are shorter. Its head resembles that of a ram, with long straggling hairs about the mouth, but no beard like the goat. The horns, according to the drawing given by Pallas, bear a similarity to those of the Merino rams; their weight is about sixteen pounds; the tail is short. The summer covering of the argali is a short sleek hair, resembling that of the deer; the winter coat consists of wool, like down, generally of a white colour, and intermixed with longer hair. See ARGALI.

From the facility with which the young of the argali is domesticated, and from the character of this animal, as well as its situation, we may with much probability infer that it was the parent of the Asiatic flocks. According to other travellers, the coat of the argali is of a grey or nut-brown

colour: probably it may be of different colours in the different districts it inhabits. In early ages the fleeces of domestic sheep appear to have been all of a dark colour: such was the flock of Laban, in Mesopotamia; and the narrative of the manner in which the change was effected, may serve to shew that, previously to that time, the common colour of the sheep was black or dark-brown. The improvement in the quality, as well as the colour of the fleece, has always been closely connected with the progress of the arts; for we uniformly find in countries, where these have flourished, a race of sheep which yield wool of a superior quality to those around them. In Persia and Syria, the influence of ancient manufactures is still visible in the superiority of their sheep, as fine-woolled animals. From Asia Minor these animals were transported into Greece, and from thence into Italy and Sicily. They were dispersed by the Romans over various parts of Europe; and the Tarentine sheep, formerly celebrated for their fine soft wool, were introduced into Spain, where they have flourished for sixteen centuries; the present Merino race being their immediate descendants, but rendered more hardy by an intermixture with the original native sheep of Spain.

From the writings of Columella, and the incidental circumstances mentioned by ancient historians, we may infer that the fine flocks of Greece and Italy were of the short-woolled kind, producing clothing wool, which was manufactured into woollen cloth, similar to what is at present worn; but probably more flexible, from not undergoing so completely the milling or felting process. (See WOOL.) Indeed, from the remains of the Tarentine flocks at present in Italy, we can be at no loss to determine the nature of the former Tarentine fleece. Thirteen centuries of neglected cultivation, and intermixture with other breeds, have not been sufficient to obliterate the labours of former times. From what we have seen of the finer Italian wools, we have no hesitation in asserting, that by judicious and careful selection, it would be practicable to restore the Tarentine race once more to its original purity, in the course of a few years; were it found to possess any superior merit, compared with the fine-woolled sheep of Spain. The circumstances respecting the management of the Tarentine flocks, recorded by ancient writers, when compared with the present treatment of the Merino flocks in Spain, leave no doubt respecting the origin of the latter.

The term Merino, in the Spanish language, is an adjective, derived from the corrupt Latin *merinus*, or *majorinus*: when united with *ovejas*, it signifies the royal judge, or superintendant of the sheep-walk. At the period when the *trashumantes*, or travelling flocks in Spain, were established, they became the objects of police, and were placed under the exclusive jurisdiction of mayors, with public walks and large districts allotted for their sustenance, and were termed *Merinos ovejas*, or the sheep under the care of the merino or mayor. The names peculiar to the establishment of these flocks, such as *mesta*, *cavana*, &c. are derived, not from the Morisco, but from the provincial Latin that prevailed in Spain before and after it was subdued by the Goths. (See MESTA.) The management of the flocks is peculiarly Roman; the merino, or mayor, corresponds exactly with the magister pecoris of Varro and Columella, and was superior to the opiliones and pastores. The practice of destroying half the sheep at their birth, and of suckling each of the survivors on two ewes; of sweating the sheep before they were shorn, to increase the softness of the fleece; and of conducting them from their winter to their summer stations, by long journeys through public sheep-walks, has been derived from Roman institutions, with this difference, that in Italy their migrations were

SHEEP.

were confined to the coarse-woolled sheep, while the *molles oves*, or fine-woolled flocks of antiquity, were always housed.

The experiment of Columella's uncle ascertains the early introduction of fine-woolled sheep into Spain. Having procured some wild African rams at Cadiz of a coarse fleece, but of an admirable colour, he gave them to some fine-woolled ewes, and the male progeny being again given to Tarentine ewes, the offspring, with their descendants, united the paternal colour with the peculiar softness of the maternal fleece. Columella's uncle resided in Bœtica, which comprehended the modern Estramadura; and as Columella flourished under the emperor Claudius, the Tarentine breed must have been introduced into that province at the commencement of the Christian era. Whatever was the peculiar colour which the elder Columella introduced by means of African rams into his Tarentine flock, we may conclude that the same successful expedient was employed by other agriculturalists of Bœtica, to convert these coarse into fine-woolled breeds, and to communicate the purest white to the black or parti-coloured native flocks, which, according to Pliny, were common in Spain. The original intermixture of distinct breeds of native Spanish sheep with the Tarentine in different parts of Spain, may be inferred from other circumstances: each cavana, or flock, forms a distinct breed; and the Nigrette no more resembles the Paulac, than the Merino South Down resembles the Merino Cheviot. The genuine unmixed descendants of the Tarentine breed would have preserved one uniform character; but the native flocks crossed with Tarentine rams would retain their distinctive varieties, and transmit them to each cavana.

That the Merino is a mixed race, seems to be further indicated by the more tender constitutions of the fine-woolled flocks of antiquity. Of these, the Tarentine were most celebrated in Italy, and the Milesian in Asia Minor. They were termed *pellitæ* and *testæ oves*, from the coverings of skin with which they were clothed to defend the fleece. They were denominated also *molles oves*, not only from the softness of the fleece, but from the delicacy of the constitution. They were always fed in the house; and though satisfied with brambles, or the coarsest food, they are described as a most voracious breed: a diminution of their allowance from the fraud of servants, or the parsimony of the owner, was attended with certain destruction to the flock. (Plin. lib. viii. cap. 47.) As there was no sale for the lambs, nor any profit from the milk of a Tarentine flock, half the lambs were destroyed at the birth. The ram-lambs were chiefly reared, and were killed at two years, when their pelts sold to the merchant at an advanced price, on account of the beauty of the pile. This breed demanded constant care, when in the fields, to preserve their coverings from being torn, and the fleeces destroyed. At home they required even greater care than abroad, as they were not daily conducted to their pastures. They were frequently uncovered and cooled for refreshment. The staples of the fleece were opened and disparted, and were frequently moistened with wine and oil. The whole flock was washed three times a-year, when the weather was warm. The fleeces were frequently swept, cleaned, and fumigated: for these different offices two shepherds were constantly required for every hundred sheep.

The excessive care bestowed on these flocks by the nations of antiquity, shews in what estimation their fleeces were held; and though such attention is remote from modern practice, we are fully convinced that, by selecting the very finest and softest Merino flocks, and covering the wool, and frequently anointing and washing, it would give to the

pile that degree of softness which is so much wanted in the manufacture of shawls, and other costly articles of luxury, but which we seek for in vain in the finest fleeces of modern Europe. However expensive such attention might prove, we have no doubt that, on a limited scale; it would well repay the labour of the judicious experimentalist, as the wool would be worth more than 30s. per pound, could it be made to equal that of India in softness. It would appear that the Tarentine breed were selected with much care for breeding, and every expedient adopted, which was proved by experience to attenuate and soften the pile. The transition of these delicate animals into the Merinos of Spain, which are a hardy race, can only be explained by supposing that other agriculturalists had imitated Columella, and obtained a fine-woolled race, by crossing their native breeds with the more delicate animals from Italy. The beginning of this improvement is indeed described by Strabo in the reign of Tiberius: he informs us that the inhabitants of Truditania had formerly imported many garments, but that their wool in his time surpassed that of the Coraxi, and excelled it in beauty so much, that a talent, equal to two hundred guineas, was the stated price of a ram to breed from; and that they excelled also in the fabrics which the *Salatiæ* manufactured. Truditania, according to Strabo, comprehended the province of Bœtica, from the Guadiana to the confines of Lusitania, and southward to Gibraltar, and eastward to Toledo. The wool of the Coraxi, with which Strabo compares that of this part of Spain, we are informed, in his account of Pontus, was from the soft-woolled Milesian sheep. Such high prices as a talent must have been produced by a very general demand for rams, not for the use of the Tarentine flocks, which could occasion no such competition, but for the purpose of crossing the indigenous breeds of the province, which, from the earliest period, appears to have abounded in sheep.

The travelling flocks were not at that time introduced, as the mountainous regions had been till then infested by native as well as Lusitanian robbers, whom the Romans dislodged from their villages, and dispersed into cantons. (Diodorus Siculus, lib. v. cap. 32.) The Moorish looms of Andalusia and Catalonia, and those of the Christians at Segovia, in the 13th century, must have been supplied by the fine-woolled flocks introduced by the Romans. The vacant mountains, when cleared of banditti, offered a vast range of pasture from Estramadura northward, towards Galicia and the Asturias. A similar opportunity occurred to establish or renew the institution of travelling flocks when the Christians descended, in the middle of the 13th century, to occupy the conquered provinces of Andalusia and Murcia. After that time the travelling flocks became so well established, that the *mentargo*, or tolls, on their passage through the mountains, from province to province, the *servicio*, or tax to the crown, and the laws of the *meita*, were imposed or ratified by government, in the middle of the 15th century, before the Moorish kingdom of Grenada had been finally reduced.

We are thus enabled from history to trace the introduction and establishment of the Merino race of sheep in Spain, from which, or from their descendants, nearly all the manufactories of fine cloth in Europe are at present supplied with wool. See WOOL.

The native breeds of Bœtica were originally and gradually converted into fine-woolled animals, by repeated crosses with the Tarentine flocks, and thus an immense number of hardy sheep, producing a most valuable pile, were spread over the country, and survived the successive conquests of the Goths and Vandals, and the protracted warfare

SHEEP.

fare of many centuries. The pure Tarentine breed in Greece and Italy being more delicate, is said to have become extinct with the destruction of the Roman empire; but the mixture of this race with the original flocks of Italy may still be distinctly traced, particularly in the middle and southern parts. The Italian wool was finer than that of any other country in Europe, except Spain, prior to the improvements which have recently taken place by the introduction of the Merinos. It is not improbable that the fine-woolled flocks of England, though greatly inferior to the Merinos in the quality of the wool, were also originally descended from crosses with the Tarentine breed introduced by the Romans, when they established a manufacture of woollen cloth at Winchester.

The destruction or deterioration of the improved flocks in the ages of barbarism which succeeded the fall of the Roman empire, was the natural consequence of the decay of the manufactures, and of a total inattention to prevent the intermixture with coarser breeds. In Spain alone, the improved race had taken such complete possession of the mountainous districts, that it remained unmixed and unimpaired till the revival of commerce and the arts, when that country supplied the neighbouring nations with fine wool, and was supposed to possess some peculiar advantages of soil and climate, which it would be vain to seek for elsewhere. The opinion that the superior fineness of the Spanish fleeces was derived entirely from some peculiarity of the soil and climate, had obtained so generally, and was so firmly believed, even twenty-five years since, in this country, that he who asserted the contrary, was regarded by agriculturalists and clothiers as a speculative theorist, only deserving their pity.

It is not a little remarkable, that this prejudice continued undiminished nearly a century after the Merino sheep had been introduced into Sweden and Saxony, and had continued to produce wool in those countries, equally fine with that of their parent flocks in the Spanish peninsula.

It might have been previously supposed that the climate of Sweden, being much colder than that of Great Britain, and more remote from the annual mean temperature of Spain, would render that country peculiarly unfriendly to the Merino race and to the production of fine wool. This prejudice respecting the influence of climate would have been removed by considering that almost all the finest furs are the production of cold climates, and that the growth of fine wool and fur is a provision of nature, to defend animals against the severe cold of the districts nearer the poles. Mr. Alstroemer, who had previously endeavoured to ameliorate the breed of sheep in Sweden, by importations from England and Germany, obtained a flock of Merinos, which he introduced into that country in the year 1723. In the year 1739, the Swedish government, for the promotion of this race, instituted a school of shepherds, under the direction of Mr. Alstroemer, and public funds were appointed for granting premiums to those who sold rams of the Spanish breed; and from the same period, to 1780, a premium of twenty-five *per cent.* was also granted on the sale of fine wools of a good quality. These premiums were afterwards reduced, and finally discontinued in 1792, being no longer necessary. From exact accounts, it appears that the fine wool sold from 1751 to the year 1790, amounted to 3,402,961 francs.

The quantity of fine wool actually produced was much greater than what had been sold to receive the premium, a considerable part having been consumed in domestic manufactures by the growers and others; and the distance of the public magazines, where the wools were sent to receive the premium, prevented the public returns from including

the real quantity of fine wool grown. In the year 1764, there were in Sweden 65,369 sheep of the pure Merino race, and 23,384 of a mixed breed, producing fine wool. The Swedish Merinos preserve their primitive form; their fleeces are very close, and the wool has not deteriorated in fineness length, or elasticity; and the sheep produce as great a weight of fleece as in Spain, wherever they are supplied with a sufficient quantity of food. This race, now naturalized in Sweden, are larger and stronger than the Spanish sheep. M. Laysteire examined the flock of M. Schulzenheim, at Grönsoe, in the province of Upland, which had been introduced from Spain 55 years. On comparing the wool with that of other Spanish sheep recently imported, he did not find it inferior either in beauty or fineness. M. Schulzenheim preserved the descendants of sheep which he imported from Spain to the fifth generation, and the comparison of their fleeces proved that they had not in the least degenerated. These facts prove decidedly that the Spanish sheep do not lose the good qualities of their wool by a removal to cold countries. At the same time it must be observed, that those sheep degenerated which had been neglected, or treated in the same wretched manner as the native flocks, by confining them in damp, infected, and dirty stables during a part of the year, and omitting the requisite quantity of food; or pasturing them in summer in forests and marshes, or in low moist situations, where they could neither find the proper kind nor due quantity of herbage.

The introduction of the Merinos into Saxony took place in 1765, and again in the year 1778. The first flock consisted of one hundred rams and two hundred ewes, chosen for the elector of Saxony from the best flocks in Spain; they were placed under the care of a Spanish majorinus, or mayor, at Stolpen, six leagues from Dresden, on the frontiers of Bohemia.

After ten years' experience, it was found that they had preserved all the original good qualities of the fleece, and the wool from the mixed breed had also acquired a degree of fineness which did not yield to that from Spain. As soon as it was ascertained, by experience, that it was easy to naturalize the Spanish sheep in Saxony, and that the crosses from this race with the native flocks were so greatly ameliorated, the attention of the agriculturalists was directed to the general improvement of the flocks, and such has been the success, that their produce is at present one of the greatest sources of profit to the cultivator. During the last fifteen years, a very considerable quantity of fine wool has been imported from Saxony into England, and the price of the best sort is greater than that of the finest Spanish wool, a sufficient proof of the estimation in which it is held by the manufacturers. It is better suited for the finest kerseymeres, and the more delicate articles of the woollen trade, as it can be spun to a greater length than any other kind of carded wool grown in Europe; it is also superior in fineness, but owing to the scarcity of winter food, it is generally less found than the best Spanish, and not so well suited for stout cloths. See WOOL.

The Merino race has since been introduced into Denmark, the Prussian states, Austria, France, Holland, Italy, the Cape of Good Hope, and the United States of America. Of its introduction into England, we shall afterwards speak.

As Saxony is the only country which has yet cultivated the Merinos so extensively, as to come in competition with Spain in the exportation of fine wool, it may be proper to state the modes of treatment adopted in that country. It is generally believed in Saxony, and in other parts of Germany and Holland, that the practice of breeding from the same race

SHEEP.

race, or what the English graziers technically denominate "breeding in and in," occasions a deterioration of the flock; owing to this prejudice, the Swedish farmers frequently change the rams of the Spanish race for others of the same race from neighbouring flocks, and some proprietors bind their farmers to renew a certain quantity of rams every year. But this practice is useless, where the rams upon an estate are already of a good quality; if the contrary were the case, there could not exist a perfect Merino sheep in Spain, as these sheep have continued to breed from the same stock, without any attention to consanguinity, for many centuries. The good quality of a race of sheep may be preserved, either by selecting the most perfect from the same flock to breed from, or by constantly taking out those which are most defective.

The common food of sheep in Saxony, during winter, is hay, which is distributed three times a day, in a greater or less quantity, according to the stock of the farmer: those who have not sufficient hay, substitute pease-straw, vetches, and lentils. They take care to mow the crops before maturity, that they may be more nutritive, and to prevent the fall of the leaves before mowing. Some farmers supply the deficiency of hay with powdered oil-cakes, crushed feeds, and meal; they put the cake or meal into troughs with water, which they give the sheep to drink, and afterwards they give them the solid residue, which sinks to the bottom of the trough. This treatment serves to keep them in a healthy state, at a season when they cannot have fresh food. Eight pounds of cake or meal diffused in water are given to every hundred sheep. When the snow remains long on the ground, they sometimes give them straw which has not been thrashed, and even corn; but as this is expensive, they generally substitute roots of different kinds, such as beets, turnips, and carrots, but particularly potatoes.

The Saxon farmers collect with great care the horse-chestnuts in autumn, which they give their sheep as a remedy against the rot. The nuts are cut small, to prevent them getting into the throat, and choking the animal.

They send out their sheep in winter, when the weather permits, and the snow is not too deep, to the woods or dry situations sheltered with underwood. Proprietors who have no winter pastures, leave their sheep in the sheep-houses from the beginning of November to April, but they take care to turn them out each day in the fresh air, for three or four hours, and they keep open the doors, to cause a constant ventilation. Some proprietors keep their sheep confined the whole year; and where the sheep-houses are kept clean, and the sheep are supplied with proper food, this practice is not found to injure either the wool or the animal.

During fine weather in summer, they are allowed to range in the pastures. They leave the sheep-house after the dews are entirely dissipated, and they repose in the shade during the heat of the day. This practice of providing shade during the hot weather cannot be too strongly recommended to the cultivators of fine wool in England, both with respect to the health of the animal and the improvement of the wool. Nor is another practice less deserving their attention, which is, to shelter them during heavy rains, hail-storms, and thick fogs. In many sheep-houses, water is conducted in troughs, from which the sheep may drink at pleasure. Saxon farmers consider salt not only as necessary to the health of sheep, but as contributing to the fineness of the fleece; it is sprinkled in their forage, and is dissolved in their drink; it is given principally in summer, when the weather is dry. They cease to give it to the ewes five or six weeks before lambing, because they think that the excess of water which it occasions them

to drink, is injurious to them at that time, and that it also prevents them from licking their lambs.

The rams and ewes are not put together before the age of two or three years: they allow one ram to twenty-five ewes, and leave them together day and night during the season. The lambs are kept in the sheep-houses, but some proprietors allow them to go out with the ewes after eight days.

Before shearing, the sheep are washed in the English manner, but with greater care. First they make them swim through a river or dam; the following day they are again driven through, and plunged in separately, and the fleece pressed with the hands, beginning from the head, and passing on to the extremities of the body; they are again driven through the water in the afternoon. The fleece is suffered to dry during two days, and shorn on the third. Saxony wool, thus washed, is much cleaner than the English, which generally undergoes but one washing. It loses by a further scouring by the manufacturer, about 12 *per cent.* more than Spanish wool already scoured. English wool loses about 25 *per cent.* in the hands of the manufacturer.

The general treatment of the Saxon Merino sheep we consider as judicious, but we have frequently noticed that the wool had been somewhat injured by want of sufficient nourishment in winter, which renders it tender. The hay being given in racks, seeds and straws fall into the fleece when the animal is eating, which the English manufacturer finds great difficulty in eradicating; this might be prevented, in a considerable degree, by lowering the racks, so that the food might be level with the head, or somewhat below.

As France is perhaps the most formidable rival which our manufacturers of fine cloths will meet in foreign markets, the progress made in the amelioration of her native flocks becomes an object of interest to the English agriculturalist and clothier. The celebrated minister Colbert first formed the design of improving the breeds of French sheep, by importations from England and Spain. But his intentions were at that time opposed. It was not till the year 1776 that the Spanish breed was introduced into France by M. M. Trudaine, intendant of finances, under the direction of the celebrated naturalist d'Aubenton. The experiments which he made on these sheep, and numerous crosses from them, with seven distinct breeds, which he had on his estate in Auxors, demonstrated to the government that it was easy to introduce and preserve a race of sheep in France, producing superfine wool; and in the year 1786, a selection of 376 rams and ewes, from the finest flocks in Spain, was conducted, under the care of a mayor, to the farm of Rambouillet. They consisted of individuals of extraordinary beauty, superior to any previously introduced into France, but having been chosen from a number of distant flocks, they presented great varieties of shape and size, which have since disappeared by intermixture; and a new race has been formed, differing from any of the primitive flock, but which equals the best of them in form and constitution, and in the fineness, length, softness, elasticity, and quantity of wool.

It is to be observed, that the wool-dealers and manufacturers in France were at first disposed to depreciate the value of the wool; but numerous accurate experiments having proved that the cloths manufactured from it were in every respect equal to those made from the best Spanish wool, these prejudices disappeared, and the republican government, as well as that of the emperor Napoleon, interested themselves in the further introduction of Spanish sheep into France. In the year 1802 it was calculated that there were one million sheep in France, either of pure Merinos, or of an ame-

SHEEP.

liorated mixed breed. Since that time many large flocks have been imported from Spain, the temporary command which the French obtained of that country having afforded them facilities for their introduction. In the course of a very few years France will, in all probability, produce a sufficient supply of superfine wool for her extensive woollen manufactories.

The experiments which have been made by the introduction of the Merino sheep into the United States of America, the Cape of Good Hope, and New Holland, prove that fine wool may be grown wherever there are intelligent cultivators, and that it is not the gift of a peculiar soil or climate. We are, however, fully convinced, that very elevated temperatures will require greater care to prevent deterioration. The specimens of wool which we have seen from New Holland, appear to have been affected by an arid sandy soil, and by the great heat of the sun, which has in some degree injured the softness of the fleece. Between the tropics, elevated mountains and shade would be essentially requisite to preserve a race of fine-woolled sheep from degenerating.

The advantages which the Merino sheep possess as wool-bearing animals, over the native breeds of English fine-woolled sheep, consist in three important peculiarities; 1st, the wool is much finer; 2dly, it is more regularly fine over the body; and 3dly, it is grown in a larger quantity from the same surface of skin. That the Merino wool is finer than the best English, is proved from this circumstance; the best sorted Spanish wool, or the R wool, as it is called, from the finest flocks, sells at nearly double the price of the best English sorted wool, or what the wool-staplers call the prime and picked lock. Those English fleeces which yield a portion of the best sort, generally contain a larger portion of inferior sorts: sometimes eight sorts will be found in one fleece, and the finest will not constitute one-eighth of the whole. On the contrary, the fleeces of the Merino sheep are so regularly fine over the whole body, as generally to yield from two-thirds to three-fourths of the superfine or R wool. The second sort, called the F wool, is also fine; and with the T wool, or third sort, bears a higher price than the best English wool. The quantity of wool on a Merino sheep is considerably greater than on an English sheep of the same size: this is not owing to the greater length of the wool, but to the animal being more fully clothed over the body and legs; and the wool is also grown closer than on English sheep; that is, there are more filaments on the same surface. A moderate sized well-clothed Merino sheep will yield a fleece which, when brought to the same state of purity as the English wool, will weigh 3lbs. A Ryeland, Norfolk, or South Down sheep of the same size, will produce a fleece only weighing about 2lbs. The value will be nearly as five to two in favour of the Merino fleece. In this state, however, the Merino fleece is not clean, as the wools imported from Spain, which are scoured after they are shorn, and before they are sorted, by which means it is much cleaner than it can be made by washing on the back of the animal. The Merino rams are horned, which is not generally the case with the ewes. The average weight of a fat ram *per* quarter, is about 17lbs. of a ewe, about 11lbs. *per* quarter.

The shape of these animals by no means corresponds with the symmetry of form which an English grazier considers as the criterion of excellence. The legs are rather long, the neck curved, and from the throat there hangs a pendulous skin, or dewlap, which is very offensive to those who are only accustomed to view the improved breeds of English sheep. This appendage is valued in Spain, as indicating a tendency

to produce wool. The colour of the skin beneath the wool, on the back and sides, is of a rose red colour: this is also considered by the Spaniards as a sign of a robust constitution, and an abundant fleece. The only English sheep which have the same coloured skin with the pendulous dewlap, are the Ryeland, which produce also the finest English wool. These circumstances, with the ancient practice of housing the sheep, continued in Herefordshire, where it is called *cotting*, confirm the opinion before advanced, that the Ryeland sheep were descended from the Tarentine race introduced by the Romans into this country.

It is not to be wondered at, that the Merino sheep, which are cultivated in Spain almost exclusively for their wool, and not for their flesh, should present that deformity of shape which at first was particularly offensive to the eye of the English farmer, accustomed to the new Leicester and South Down sheep. There cannot, however, be a doubt that the Merino breed is as susceptible of improvement as the English. Indeed there is a very great diversity of form in the flocks in different parts of Spain; and were the same attention paid to selecting the most perfect to breed from, as has been given in England to the South Down sheep, there is every reason to believe that a new race would be formed, possessing all the good qualities which both the grazier and the manufacturer might require. The South Down sheep, which have been greatly improved, and rendered almost perfect in form, have preserved all the good qualities of the fleece. This alone is sufficient to prove, that there is no necessary connection between deformity of shape, and the fineness of the wool.

The Spanish breed of sheep were first introduced into Great Britain in the year 1787. Some individuals of the black and spotted sheep had indeed been procured, and kept in the parks of noblemen previously, but without any regard to the wool; nor was much interest excited by the flock introduced in 1787. The sheep, however, lived, though treated in the English manner, and the wool had not deteriorated. These facts having proved that the Merino race might be naturalized in England, his majesty George III. obtained from the marquis of Campo Alanzo five rams and thirty-five ewes of the Nigrette race. They were imported in the year 1792, and were for some time at Oatlands, the seat of his royal highness the duke of York. On their arrival they were extremely low in flesh, but they soon began to improve; and the diseases with which they had been affected, were removed by a plentiful supply of food. They left Oatlands greatly advanced in bulk, and with renovated constitutions; and the quantity and quality of the wool were greatly admired.

The prejudices of the manufacturers were not so speedily to be surmounted, as the difficulties attending the naturalization of the Merino sheep. Though the wool was admitted to be equally fine with the best imported wool from Spain, they would not offer a proportionate price, fearing that it might not prove equally good, when manufactured. It ought, however, to be stated, that the condition in which the English Merino wool was offered for sale, either very imperfectly washed, or entirely in the grease, prevented the manufacturer from forming a just comparison with the wools from Spain, which came to this country clean scoured, and regularly sorted; nor could they appreciate the loss it would sustain in scouring, which is not less than from 60 to 70 *per cent*. We are well persuaded that this uncertainty respecting the loss in scouring has, more than any other circumstance, retarded the sale of the English Merino wool, from the year 1792 to the present time. Nor will
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SHEEP.

our manufacturers ever greatly encourage the growth of this wool, until it be brought to market, either sorted and scoured like the wools from Spain, or in the same state of purity in the fleece as the fine English or Saxon wool. Many manufacturers, who have purchased it, have been greatly disappointed, not in the quality, which was excellent, but in the small quantity which remained after scouring. In consequence of the manufacturers declining to purchase his majesty's wool, it became necessary to have it manufactured on his majesty's account, to demonstrate its fitness for superfine cloths. This was done till the year 1796, when it was resolved to sell the wool at the price which was offered, that the manufacturers might have a fair trial. The clip was sold that year for 2s. per pound, and the following year for 2s. 2d. In the years 1797 and 1798 the wool was sorted in the Spanish manner, and scoured, after having been previously washed on the sheep's back. The following is an account of the produce.

Eighty-nine ewe and wether fleeces washed on the back	lbs.
Loss by subsequent scouring	295
Pure wool	92
	203

Which yielded, Rafinos, or R wool, 167 lbs. at 5s.
Finos, or F wool, 23 lbs. at 3s. 6d.
Terceros, or T wool, 13 lbs. at 2s. 6d.

In 1798 one hundred and one ewe and wether fleeces, washed in the same manner, yielded	lbs.
Loss by subsequent scouring	346
Pure wool	92
	254

Of which there was Rafinos, 207 lbs. at 5s. 6d.
Finos, 28 lbs. at 3s. 6d.
Terceros, 19 lbs. at 2s.

The rams' fleeces of both clips	lbs.
Loss by subsequent scouring	314
Pure wool	99
	215

Of which there was Rafinos, 181 lbs. at 4s. 6d.
Finos, 22 lbs. at 3s. 6d.
Terceros, 12 lbs. at 2s.

The prices have, since that time, progressively increased with the price of Spanish wool, and have been nearly equal to that of the best wools from Spain. In the year 1801, the right honourable lord Somerville took a voyage to the peninsula, for the purpose of selecting such sheep as united in the greatest degree the excellence of the fleece with a good carcase. His efforts were in a considerable degree successful, and, as far as related to the fleece, completely so. Since that time, particular political events have increased the facility of procuring Merino sheep from the various Spanish flocks; and the stock of these sheep in England at present is sufficiently great to change, in a few years, the whole race of fine-woolled sheep in Great Britain, were such a change desirable. Many of the native flocks of fine-woolled sheep in England have been considerably diminished in the last forty years, owing to the numerous enclosures of forests and commons, that were formerly only suited to pasture a race of small light sheep; but which, in consequence of improvement, are now capable of maintaining a heavier race of animals; the former requiring a light dry soil, and an ex-

tensive range; and the latter, a rich and more confined pasture. The Ryeland sheep in Herefordshire afford the finest wool in England, of any of our native breeds; but the pure race is nearly extinct. The fleece weighs less than two pounds; but if generally cleared from the flank-locks and skirts before it is wound, in this state it bears the highest price of any English fleeces. It is not a little remarkable, that the practice of coting or housing the sheep is peculiar to Herefordshire; and it is not improbable but it may have been originally introduced by the Romans, with the race of sheep from which the Ryelands originally sprung. A mixture of the Ryeland sheep is spread over some of the counties adjoining to Herefordshire, but the number is not very considerable. The light sandy soil of Norfolk is pastured by another breed of fine-woolled sheep, which supply a considerable quantity of fine English wool for the Yorkshire market; and it possesses, in an eminent degree, the property of softness, when manufactured, which is wanting in many of our English wools. The original Norfolk breed have black faces and spiral horns, small, long, thin carcases, with long black or grey legs. The fleece weighs from one pound and a half to two pounds. The form of the animal is not such as to recommend it to the grazier, but it has been greatly improved by an intermixture with the South Down breed. Mr. Coke of Holkham, the celebrated agriculturalist of Norfolk, has disposed of his native flocks of that county, from a conviction, founded on long experience, that they are an unprofitable breed. The principal recommendation of this breed was the excellence of their wool; and they might be well suited to the former uncultivated state of the sandy tracks in that district.

Of all the native fine-woolled breeds of England, the South Downs appear to possess, in the most eminent degree, the combined advantage of excellence of form, with a superior quality of the fleece. The average weight of the two-year old wethers is 18 pounds per quarter; the mutton is fine-grained, and of an excellent flavour. The weight of the fleece of the finest kinds is about two pounds on the average. Some of the coarse fleeces exceed three pounds. The South Down breed takes its name from the district on which these sheep were originally cultivated. It is a long range of rather elevated chalk hills, extending from the south-western side of the counties of Kent and Surrey, through Sussex, into Hampshire, consisting of open downs, well suited for sheep-walks.

The animal has no horns; its face and legs are grey; the bones fine, and the form compact. It has indeed been greatly improved of late years, by the particular care of intelligent growers. The lambs are generally dropped from the middle of March to the end of April. If the ewes have been well kept, one-third will be twins. The wethers are fit for the butcher in two years; many graziers fatten them at 18 months. From the South Downs these sheep have been sent to different parts of the kingdom; and in all dry and rather elevated situations they will preserve the excellent qualities of their wool. Indeed, in all situations where the soil is covered by a good close herbage, and the subsoil is not calcareous, the wool will be of a superior quality to what the same animal would produce on the chalky downs of Sussex. Of this we have had decisive proofs. The South Downs, though in many respects well suited to sheep, yet in those parts where the chalk is exposed, or near the surface, the calcareous particles get intermixed with the yolk or natural grease of the fleece, and produce a degree of harshness in the wool, which is very perceptible, when it is manufactured into cloth: it also injures the felt-

SHEEP.

ing quality of the wool. This is so well known to the Yorkshire manufacturers, that they always avoid the wools grown on chalk soils, when they want a soft thick pile to the cloth. The fine wool from the South Down fleeces is chiefly used for light goods, such as kerseymeres and pelisse cloths, which require very little milling or felting. When the South Down sheep are removed from chalk lands, the wool may be grown remarkably soft, and possesses all the good qualities of the best native English wool.

The action of the soil on the fleece was long known to manufacturers, *viz.* that wools grown on argillaceous soils were softer, and proved better in the process of manufacture, than those on calcareous soils. The cause of this was involved in much obscurity, and generally supposed to be owing to the quality of the herbage on different soils. Mr. Bakewell, of Wakefield, in Yorkshire, in a little tract "On the Influence of Soil and Climate on Wool," proved that the influence of the soil on the fleece arose from the action of the minute particles on the surface of the fibre or staple. "Not only can this action affect the quality, but impart indelibly the colour of the soil to the wool. In part of Gloucestershire the fleece acquires a deep orange colour from the soil. In Hertfordshire, and part of Warwickshire, and in every country having a red soil, the wool is inclined to brownish-red. Wools on chalky soils are distinguished by their whiteness; and in every district in England the action of the soil is evinced, by communicating its own colour to the fleece. The colour thus acquired is as indelibly fixed in the wool as the colouring matter of an artificial dye, nor can its whiteness be perfectly restored by any artificial process hitherto known.

"That the same cause can change the hardness or softness of wool, is proved from the different effects which argillaceous, siliceous, and calcareous soils are invariably found to have on these qualities. This is perhaps no where more clearly shewn than in the northern part of Derbyshire, where the strata are so abruptly broken, that two adjoining farms, separated by a small brook, will not unfrequently be found, the one upon lime-stone, the other on a siliceous grit or sand-stone. The difference of the wool on these two farms, from the same breed of sheep, was so distinctly marked, that the grower always obtained a higher price when grown upon the latter soil. 'My wool is grit-stone, and I expect a better price than my neighbour,' was the language in common use, and the meaning was well understood by the buyer. In the process of separating wool from the skin by the fell-monger, the pelts are steeped some days in lime and water. The softest wools, when thus exposed to the action of lime, lose their distinguishing excellence, and acquire all the hardness of wools grown on lime-stone soils."

To remedy this injurious effect of calcareous soils, Mr. Bakewell recommends the practice of the farmers in Northumberland, and in North Britain, of anointing the skin of the animal with butter, in which a small quantity of tar is melted to give it consistence. In Northumberland this is practised with the fine-woolled sheep on the Cheviots; and the wool from these sheep bears a higher price in Yorkshire, in proportion to its relative fineness, than any other English wool, on account of the superior softness of the cloth made from it. The ointment is also found to defend the animal against flies and sheep-ticks, and to be a preservative against the severity of the weather. The only inconvenience is, that the whiteness of the wool is in some degree affected by it; and it is not suited for white stoved cloth, or for any delicate colours. Could any good and cheap substitute for tar be devised, there cannot be a doubt that the practice would be of great

benefit to the South Down fleeces on their native chalky soils. It is, in fact, similar to what the Romans adopted with the Tarentine breed, which were frequently washed, and the skins anointed with the dregs of olive-oil, mixed with other ingredients. A similar treatment of all English sheep, after being shorn, would be found a most effective remedy against flies and insects when the skin is exposed; it is also proved by experience to be a preservative against the scab.

The South Down breed, so far as relates to the fleece, will admit of considerable improvement in the following particulars. First; it might attain a degree of fineness more nearly approaching that of the Merino fleece: secondly, the fleece might be grown more uniformly fine over the body: and thirdly, almost all the South Down fleeces have a few grey or black hairs intermixed, which is a great defect where the goods made from it are intended to be stoved white. At present, the finest part of the South Down fleeces, called by the wool-stapler the prime, does not bear half the price of the prime Spanish, or R wool, from the best Merino flocks. In the South Down fleeces very rarely more than one-fourth part is of the best quality; but in the Merino breed full two-thirds of each fleece will be of one uniform quality, and that the prime or R wool. In the South Down fleeces, those parts from the buttocks and shanks will also be as coarse as the coarsest wool from heavy sheep. These defects in the South Down fleeces are common to almost all our native fine-woolled sheep, except the Ryeland; but we conceive they admit of a remedy without any injury to the form of the animal, or the weight of the fleece. If the opinion of an intelligent wool-stapler were first taken on the qualities of the different fleeces of those ewes from which it were proposed to raise a stock, and selecting for them some of the best formed rams bred from South Downs and Merinos, called Anglo-merinos; from this progeny the most perfect forms might be again chosen: and if these were still too strongly marked with the character of the Merino form, another cross with perfect South Down ewes would produce a progeny from which a race might be selected possessing whatever was desirable in the carcase, with a considerable amelioration of the fleece, both in the fineness of the wool and the regularity of the quality, over the greater part of the skin. The weight of the fleece would also be increased, for the wool is grown closer and thicker on the Merinos than on any of the English breeds; and this property continues in the crosses from that breed. The advantage of employing an intelligent wool-stapler to judge of the quality of the fleeces will be admitted, when we consider that a fibre of the finest wool is perhaps little more than the two-thousandth part of an inch in diameter; and that a variation from this, which is too small to be visible by the unpractised eye, may occasion a difference in price not less than 40 per cent. Indeed, it is truly astonishing that the eye can detect this microscopic difference unaided by instruments. Nothing but long and constant practice can secure the facility of determining the fineness of wool; and the most experienced dealer in English fine wool, were he to discontinue entirely the examination of wool for three months, would not be able, at first sight, to ascertain its quality and value to 15 or 20 per cent., supposing no change to have taken place in the markets. Can it then be supposed that a grazier, who has never acquired this fine sense of vision, and to whom wool is only an object of particular attention at one season of the year, we say, can it be possible for such a person to be an accurate judge of the quality of wool, and the comparative fineness of fibres ranging between the fifteen-hundredth and

SHEEP.

the two-thousandth part of an inch? Yet many of our English wool-growers will decide, with the utmost confidence, whether their wool be finer or coarser than it was in the former year; or rather, they will decide that their wool is always growing finer. To this great confidence of the wool-growers, and to their real ignorance on this subject, more than to any other cause, may be ascribed the little improvement in the culture of English fine wools prior to the introduction of the Merino breed into Britain.

The South Down breed, in its improved state, is likely to supplant most of the English fine-woolled breeds, except perhaps the Cheviots in Northumberland, which are become habituated to the severity of the climate, on the elevated hills in the northern parts of that county bordering on Scotland. This race we think much better suited to supplant the coarse-woolled sheep in the Highlands of Scotland, than another of our English breeds. The Cheviot sheep are described by Mr. Culley, an intelligent farmer in Northumberland, as hornless; the faces and legs are, in general, white: the *best kinds* have a fine open countenance, with lively prominent eyes; the body long, fore-quarter wanting depth in the breast, and breadth both there and on the chine; fine, clean, small-boned legs; thin pelts; weight of carcase, when fat, from 12lbs. to 18lbs. *per* quarter; fleeces from 2lbs. to 3lbs. The qualities of the Cheviot fleeces are various; some of them contain a small portion of fine wool, which, as we have before remarked, is more soft than any of our native English wools. The price at Lord Somerville's annual show in 1813, for the best cloth from English wool, was given to Mr. J. F. Smith, for a piece of cloth manufactured from the prime part of the Cheviot fleeces.

In general, the quality of these fleeces might be much improved by a judicious selection. The great defect is, that in the finest fleeces only, a small part is of the best quality. Some of the Cheviot sheep are speckled on the face and legs; but these are probably a mixed breed, from crossing at different times with Heath sheep, to whom they have long been neighbours; for leaving the heights of Annandale to the eastward, we insensibly lose the Heath sheep and mixed breeds; after which all the extensive fine green hills on the Scotch and English borders from the fides of the Cheviots to the barren heaths of Lammer-muir are covered with the Cheviot breed. The *best kind* of these sheep is certainly a valuable mountain-sheep, where the pasture is mostly green sward, or contains a large portion of that kind of herbage, which is the case with all the hills around the Cheviots, where these sheep are bred; and the fine herbage which the border hills every where produce, supports them so well in summer, as to enable them to stand the severities of the winter.

The shape of this breed of sheep has been greatly improved of late years, but will still admit of much improvement. "We cannot (says Mr. Culley) expect the perfection of this breed of sheep can be obtained at once, it must proceed by slow gradation, as every other improvement hath done.

"That breed of sheep which brings the most profit to the farmer will always be preferred, but this object is not to be obtained in this district by fine wool alone. Perfect mountain sheep should be hardy, well-formed, and quick feeders. These qualities will always recommend them to the grazier; but if to these qualities, so essential to the sale of a mountain farmer's stock, can be added a fleece of fine wool, a breed of sheep might then be obtained, the properest for a hilly district of any we have yet seen. There is little doubt but this may be accomplished by proper selection, and probably

the best kind of Cheviot sheep, from their hardiness, and producing a portion of fine wool, are the properest stock for laying the foundation of so desirable a change." With these sentiments of Mr. Culley we entirely agree, and particularly in the propriety of selecting from the best Cheviots to lay the foundation of a valuable stock of mountain sheep, which might supplant the coarse-woolled Heath sheep in North Britain. Every situation may be said to have its peculiar advantages for particular breeds of sheep; and the rage for improvement, and desire of change, have in some instances been carried too far. There can be no doubt, that the rich pastures on the eastern side of England are better suited for heavy long-woolled sheep than for South Downs or Merinos, whilst it would be folly to attempt to stock the mountainous parts of Britain with the Dishley or Lincolnshire breeds. But many of the flocks in the uplands are susceptible of much improvement by selection, without any admixture, and in very exposed situations it might not be desirable to attempt improvement by introducing a less hardy race. In dry and moderately elevated situations there are none of the finest-woolled native or Anglo-merino breeds, that might not be cultivated with advantage; but we are well persuaded, that with the present demand for, and price of animal food, the breed which will send into the market the largest quantity of good meat in the shortest time, will have the preference over any superior quality of the wool alone. On which account the improvement of the South Down breed, which combines both advantages, is perhaps an object the best deserving attention, in all situations suited for fine-woolled sheep, that are not too much exposed to the inclemency of the climate.

A particular race of sheep exist in the Shetland islands, which produce a fleece more like that from the sheep on the mountains of Thibet, than any of the European sheep with which we are acquainted. From the report of Mr. Thomas Johnson, addressed to the British Wool Society, it appears that there are two varieties of Shetland sheep.

One of these varieties carry coarse wool above and soft fine below, and have three different successions of wool yearly, two of which resemble long hairs more than wool, and are termed by the common people *fors* and *scudda*. When the wool begins to loosen at the roots, which generally happens about the month of February, the hairs or *scudda* spring up; and when the wool is carefully pulled off, the tough hairs continue fast until the new wool grows up about a quarter of an inch in length, then they gradually wear off; and when the new fleece has acquired about two months' growth, the rough hairs termed *fors* spring up, and keep root until the proper season for pulling it arrives, when it is plucked off along with the wool, and is separated from it at dressing the fleece, by an operation called *forfing*. The *scudda* remains upon the skin of the animal, as if it were a thick coat or fence against the inclemency of the seasons, which provident nature has furnished for supplying the want of the fleece. See the preceding article SHEEP.

The native or kindly breed, which bear the soft cottony fleeces (as they are called), are rather of a delicate nature; their wool is short and open, and destitute of a covering of long hairs. These soft-woolled fleeces are very often lost or rubbed off, during the winter or early in the spring, which it is supposed might be prevented by clipping or shearing the sheep, in place of pulling off the wool, a barbarous practice, tending to weaken the sheep and hurt the length of the staple.

The Shetland sheep are of various colours; the silver-grey wool is thought to be the finest and softest, but the black, the white, the mourat, or brown, is very little inferior; it

SHEEP.

is all of the softest texture, fit for the finest manufactory, and in some instances has been found to rival Spanish wool itself: but the pure white is generally the most valuable for all the finer purposes for which combing wool can be used. For softness and for lustre, no wool equals it; and the skin, with the fleece on, can be converted into a fur of very great value, some specimens of which have already been sent to the China market.

They are in general very hardy. In the winter season, when the ground is covered with snow, they eat the seaweed very greedily, and often during long and severe snows they have little else to live upon. Nature seems to have imparted to them a perfect knowledge of the time at which this food may be procured; for immediately upon the tide beginning to fall, the sheep in one body run directly down to the sea-shores, although feeding on the hills several miles distant from the sea, where they remain until the tide returns and obliges them to seek their usual haunts.

It is to be regretted, that we know so little of this peculiar race of sheep, or of the time when they were introduced, and the country from whence they came. The wool, though intermixed with coarse hairs, possesses a most extraordinary degree of softness, approaching, if not equaling, that from the sheep of Thibet, and might, if proper attention were paid to it, be applied with advantage to the manufacture of shawls and other articles now imported from the East. None of the European wools which we have seen, possess this quality in any degree to be compared with that from the Shetland sheep. The circumstance of the fine wool growing as down under a pile of coarse wool or hair, is not peculiar to these sheep. We believe that unmixed fine wool is rather a product of cultivation than natural to the animal in a wild state. In the argali, as well as in numerous animals, the inhabitants of cold countries, the skin is covered with a short fine down, and this is protected by a covering of longer coarse hair growing through the former. By regular keeping and warmth, the coarse hairs fall off in many animals, and this has probably been the case originally with all our fine-woolled sheep, many of which, if neglected, shew indications of their original condition, growing coarse hair intermixed with the finer parts of the fleece. Even in the coarsest woolled sheep of cold countries, such as the Heath sheep in the Highlands of Scotland, we have often seen a small portion of fine wool growing under the coarse fleeces with which these animals are covered. It appears to be a beneficent provision of the Author of nature, to accommodate animals to different climates. European sheep removed between the tropics, languish and become sickly from excessive heat, and lose their fleeces in the course of the ensuing year. They are afterwards covered with a thin crop of coarse short hair. We have seen a finely-shaped ram, of the European breed, brought from Louisiana, which was entirely covered with white hair, as coarse and short as that on a dog. We have no doubt, however, that in hot climates, where sheep have the advantage of a mountain pasture, that with care and proper shelter these fleeces might be preserved, but they would certainly be a useless incumbrance. Fine fleeces seem to be more peculiarly the produce of cool or temperate climates; for it is observed, in most of our English sheep, that the part of the wool or staple which is grown during winter, is finer than that part which is grown in summer. Extreme heat and cold appear to have both an effect upon the skins of sheep, to cover them with coarse hair; but in cold climates there is also a tendency in the animal to produce a fine down underneath. It is not improbable that the Shetland sheep may have been originally descended from the Tarentine breed, the "*molles oves*," which

the Romans had introduced into Britain; their insular situation protecting them, in a considerable degree, from intermixture. For, according to Dr. Anderton, though the coarse-woolled Heath sheep are introduced into these isles, the native active sheep frequenting the more desolate wilds at the greatest distance from man, withdraw themselves from the others, and thus the breed is only partially debased by accidental stragglers. The whole system of management, respecting these sheep, is directly the reverse of what it should be, and it is truly astonishing that they have preserved so long the peculiar softness of the wool. Could these sheep be introduced into more favourable situations, and proper attention paid to them, we have no doubt that their wool might be grown free from the coarse hairs with which it is at present intermixed; it would then be of far greater value than the finest Merino fleeces, as it might be applied to the fabrication of shawls, approaching in softness to those of Cashmere.

We have now to describe the long-woolled breed of sheep, which may be considered as almost peculiar to Great Britain and Ireland; for though sheep of this breed are found in Flanders, and some other parts of Europe, their number is inconsiderable; and they nowhere exist with the same perfection of form, and producing the same quantity or quality of wool as in the united kingdoms. Their fleece is the envy of the other manufacturing countries of Europe, and can only be grown upon rich pastures. Long combing wool, and the varieties, will be described under the article WOOL; but it may be necessary here to state that the longer kind varies from six to about nine or more inches in the length of the staple, or filaments. In the manufacture of this wool by the comb, the fibres are laid parallel; whereas in short-clothing wool, they are broken in all directions by the cards.

Long wool is manufactured into shalloons, camblets, mo-reens, bombazeens, and various other articles; and a large quantity is also manufactured into what is called horse-millinery, consisting of girths, fringes, and other articles of use or ornament in equipages. The coarser kind makes the warps for carpets.

Short combing wool is manufactured into hosiery.

The Lincolnshire sheep may be considered as the original of our heavy sheep in England. These, with the new Leicester or Dishley breed, have nearly supplanted the other varieties of long-woolled sheep. The Lincolnshire breed has also been generally somewhat changed of late, by an intermixture with the Leicester breed. The original Lincolnshire sheep have no horns, and long carcasses; the ewes weighing from 14 lbs. to 20 lbs. *per* quarter; the three-year old wethers from 20 lbs. to 30 lbs. The average weight of the fleece is about 9 $\frac{3}{4}$ lbs., or three fleeces to the tod of 28 lbs. Some of the heavier fleeces weigh 14 lbs. The richer parts of Lincolnshire will support five of these sheep on the acre; and when we take into account the price of the wool, which in 1814 was 2s. *per* pound, it will be seen that the sheep of this description are the most profitable for the lands to which they are suited. The improvement made in their form, by the mixture with the Leicester breed, reduced the weight of the fleece; but the extraordinary demand for heavy combing wool is inducing some of the farmers to return to their heavy breed. It is probable that this kind of wool will not soon fall under 1s. 6d. *per* pound; and the production of a fleece, which weighs 10 or 12 lbs., must be an object of attention to the grower, not less than that of the carcase. For though the wool from the Leicester breed is somewhat finer, the weight seldom exceeds 7 lbs., and the difference of price is not more than about 2s. *per*

SHEEP.

per tod of 28 lbs. The advantage of the latter breed consists in being made fit for the butcher in less time: in this it excels all the other breeds before known. At the time when Mr. Robert Bakewell of Dishley, in Leicestershire, directed his attention to the improvement of sheep, the price of long wool was less than 4*d.* *per* pound: the fleece was hence of little value to the grower, and Mr. Bakewell was exclusively employed in improving the carcase of sheep, and all other domestic quadrupeds. Previously to about the middle of the last century, little attention was paid to the improvement of live-stock, except horses. Nothing could be more repugnant to common sense than the general practice of farmers: they selected for slaughter that part of their flock which was most disposed to fatten, as offering them an early profit; the remainder were left to breed from promiscuously. A considerable part of England was then uninclosed, and the flocks of different proprietors being unavoidably intermixed, prevented a due regard to the improvement of the breed. Mr. Bakewell commenced his improvements subsequent to the year 1760, and succeeded in exciting the attention of the public to the amelioration of live-stock, by shewing the most effectual method of accomplishing this important object. The principal object which Mr. Bakewell had in view, in his improvement of different animals, except horses, was to produce the greatest weight and value of flesh, with the smallest expence of food.

Availing himself of the observations which he had made on different animals, that certain peculiarities of form were always attended by a disposition to grow fat, and that animals inherit this disposition from their ancestors; and if they are kept free from intermixtures with other breeds, in the course of a few generations the peculiar properties will be perpetuated, and form a distinct race; the laws of animal life being in this respect regular and permanent. He, therefore, selected from his own flock, and from the flocks of others, those sheep to breed from, which possessed in the greatest degree that perfection of form he was desirous to attain and perpetuate. By judiciously crossing them, and selecting the most perfect of their progeny, he at length succeeded in forming the breed, which has been distinguished by the name of the new Leicester or Dishley breed; and having attained his object, he carefully guarded against any future intermixture with other breeds. This breed exceeds all others in its propensity to fatten; and by crossing with rams from this breed, a very considerable portion of the long-woolled sheep in England have been greatly improved in this respect.

The peculiar characters of these sheep have been well described by Mr. Culley, an eminent grazier in Northumberland, who introduced the breed into that part of England. "The Dishley breed are particularly distinguished from other long-woolled breeds, by their fine lively eyes, clean heads, straight, broad, flat backs, round (barrel-like) bodies, very fine small bones, thin pelts, and inclination to fat at an early age. The last property is probably owing to the before-specified qualities, which, from observation and experience, there is reason to believe extends generally through every species of domestic quadrupeds. The Dishley breed is not only peculiar for its mutton being fat, but also for the fineness of the grain: the flavour is superior to the mutton of most other long-woolled breeds. The weight of the carcase may be stated in general: ewes, three or four years old, from 18 lbs. to 26 lbs. *per* quarter; wethers, two years old, from 20 lbs. to 30 lbs." The fleece is stated by Mr. Culley at 18 lbs.; but in Leicestershire, we believe, the average weight is not more than 6 or 7 lbs., about four

and five to the tod. The wool is finer and shorter than the Lincolnshire, and a portion of it is better suited for the hosiery trade than for thin goods, such as shalloons, &c.; but considering the difference of weight, the fleece is not so profitable to the grower as that from the Lincolnshire sheep.

There are two reasons for killing the wethers of the Dishley breed at two years old: first, they leave the most profit; and, secondly, if kept longer, they grow too fat for genteel tables. It is very common for two-years old wethers to cut four inches thick of fat on the ribs, and from two to three inches all down the back. Even ewes of this kind, which have bred and suckled lambs till July, when killed about the Christmas following, will frequently measure four or five inches thick of fat on the sides, and two or three inches down the back, all the way from the head to the tail; and though sheep of this breed are not eminent for much tallow, yet ewes, under such circumstances, generally produce from 18 lbs. to 24 lbs. of tallow each. This mutton is not so inviting as the leaner kinds, but it finds a ready market among the manufacturing and laborious part of the community.

The graziers in different parts of England, who had been too negligent respecting the improvement of stock, no sooner became sensible of the possibility of forming a race of sheep, that would produce a large weight of meat in a much shorter time than before known, than they became desirous of introducing the breed; and the taste for growing fat meat became generally adopted, and in many instances without proper regard to other considerations. In some instances, fine-woolled flocks were crossed with this breed, and it was vainly expected that they should preserve the quality of the wool, and increase the carcase at the same time. In other instances, the Leicestershire breed were introduced on land only suited for a lighter race of sheep; and even where the pastures were suitable, the propensity to fat was encouraged, until it became a disease, and the animal was scarcely able to move under its own weight. Whatever the advocates of this breed may advance in its support, it cannot be contended that the mutton is equal in flavour to that of the smaller sheep.

The object of Mr. Bakewell was in these instances mistaken: it was not to produce meat for the tables of the rich, but to supply substantial nourishment for the working classes. We have heard him say, "a small quantity of this fat meat, cooked over a large dish of potatoes, is a good dinner for a poor man's family; and this is what I proposed in the selection of this breed."

The increased demand for animal food could not have been supplied had not some improvement taken place, and the working classes will ever prefer the fattest meat. In this respect they resemble the North American Indians and the back settlers, who regard fat as the only nutritious part of meat, and accordingly Volney describes the lean by a name which signifies *meat bread*. The rage for excessively fat meat has in some degree subsided, and the new Leicesters are likely to be confined to those districts which are peculiarly suited for their growth, and the object of the grazier will be directed to producing a large quantity of meat for the consumption of the working classes. Instead of attempting to improve the fine-woolled breeds by crosses with a heavy race, it would be more judicious to pursue the same plan of improvement with those breeds which Mr. Bakewell attempted with such success in the heavy sheep.

The improvement of the carcase may, we are convinced, be effected without injuring the quality or diminishing the quantity of the wool. Of this Mr. Bakewell was well aware,

SHEEP.

aware, but the price of wool in England at the time of the American war (the period of his celebrity) was so low, that he used to say, it would be desirable to grow sheep without wool, and confine the attention to the carcase exclusively.

In selecting the most profitable breed of sheep for a farm, it can never answer to stock hilly districts with a heavy race of sheep, and in such districts the improvement of the wool is an object more particularly deserving attention, because we believe it would be possible to grow an equal weight of wool of a much finer quality than what is produced by many of our coarse-woolled breeds of sheep, and particularly by the Heath sheep, which pasture the mountainous parts of North Britain.

In rich pastures, weight of carcase must in a considerable degree supersede the improvement of the wool, at least so far as relates to its fineness; for the real interest of the grower of long wool is to produce a heavier fleece. At the present price of wool, a Lincolnshire fleece of twelve pounds being more valuable than any other native English fleeces. To combine, therefore, the perfection of form in the Dishley breed with the heavy fleece of Lincoln, is what will best reward the owners of long-woolled flocks.

There are, besides long and short-woolled sheep, numerous flocks which produce wool suited for the comb, but of a finer and shorter kind than the heavy combing wool. The worsted yarn made from this wool is spun soft, and manufactured into hosiery. A very considerable quantity of wool, suited for hosiery, is grown in the county of Kent; but the breed of sheep which produce it, has not any distinct name, and appears to have originated from an intermixture of the short-woolled sheep of the southern counties with heavy long-woolled sheep. We believe there is no country in Europe, which at present produces combing wool of this kind equal in quality to that grown in England. See WOOL and WORSTED.

SHEEP, *Stealing of*, is now made felony without benefit of clergy. See CATTLE.

By an ancient statute, no person shall keep, at one time, above two thousand sheep; but lambs are not to be accounted sheep till they are a year old. (25 Hen. VIII. c. 13.) Persons exporting sheep shall forfeit them, and 20s. for every sheep, &c. (12 Car. II. c. 32.) And persons in the counties of Kent and Sussex, within ten miles of the sea, are to give an account, in writing, after sheep-shearing, of the number of fleeces, to the next officer of the customs, &c. (9 & 10 W. III. c. 40.) See WOOL.

SHEEP, *Clatting of*, in *Agriculture*, a term given to the business of preparing the ewes of them for lambing in some places, which commonly takes place about a week before the lambing season commences. In such cases the ewes are usually driven into a pound, when the clatter, looker, or shepherd, draws them out singly and separately, turning them upon their backs, and removes with the shears the locks of wool from the undersides of their tails, from about their udders, and from the insides of their thighs. This becomes necessary, in consequence of the dirt and filth which often adhere to the wool about these parts, especially in moist growing spring seasons, when the ewes are affected with much purging. The wool being removed in this manner, not only renders the parts more neat, but enables the lamher, or person who has the care and direction of the business of lambing, to distinguish when the ewes have lambed, by the mark or stain which is generally left on the back parts of the udders; as, if such marks were not to occur, he would sometimes be at a loss, as the

young ewes not unfrequently desert their lambs, and endeavour to escape along with the other ewes, pasturing as unconcernedly as if nothing had happened to them.

Some think, that it would also be a good method at this time to have the different ewes marked in a different way about the face, in the order of their lambing, and to have those of different forwardness put together into separate suitable pastures, to be taken care of in the most proper ways.

The barren ewes, or those not with lamb, are likewise now distinguished by the clatter, looker, &c. by their not having any enlargement of their udders or their bellies, as well as by their jumping and skipping about in a nimble manner; such being usually turned off directly upon the fattening grounds.

SHEEP, *Lambing of*, the business of managing the lambing of the ewe flocks, which is very essential and important, though but little known or attended to in many places, even where sheep are almost the whole flock of the farmer. However, in consequence of this, and the employing of unskilled persons, much loss is not unfrequently sustained, to the great injury and inconvenience of the sheep-grazing farmer. In some situations, as those of the inclosed, dry, and warm kind, and the more poor mountainous ones, as well as the upland pastures and downs, such a very minute attention to this business need not, perhaps, be bestowed, as accidents less frequently occur, than on rich pastures or marshes, where the lambs are much exposed to danger and destruction from many causes, unless very carefully attended to at this time. The nature of the principles and practices which are necessary in the business of lambing, are, in short, yet much too confined and too little known to sheep-farmers in general to be of any great advantage. The first thing which is requisite in preparing for this business, is the making choice of proper dry warm fields and pastures for the purpose, and having them made as safe and secure as possible from the danger of all sorts of accidents and inconveniences to the lambs. Where they have large wet open exposed ditches, or any other sort of inconvenient fences on their sides or other parts, they should be well guarded and secured by means of suitable low dead or other hedges being raised on the sides of them, by the use of small light hurdles, about two feet in height, with two racks, fixed down around them or in the most dangerous parts; by placing brush-faggots of a proper size round the sides of their banks, and staking them well down to prevent their being disturbed by the winds and storms: by hanging old sea-nets along their banks or borders; or by some other kind of cheap low defence, which the local nature of the situation may suggest. The nature of the pastures for this use should constantly be such as are fine and short in their grass, and neither of too poor nor too rich a quality, as inconveniences are liable to take place from each of these states.

It was formerly the practice to have the lambing of the ewe flocks performed on a great breadth of pasture-land, as two or three to the acre, or in a very thin manner, which was extremely troublesome; but it is now found that much benefit attends its being done in a closer or thicker way, as ten or twelve more to the acre, in some cases; as it is not only more convenient and successful, but far more profitable. By thus doing it in a narrow compass, according to the state of the grass, the work is more safely gone on with, is more under the direction of the manager, and more convenient in case of difficulties arising in it, while there is much less danger of loss among the ewes in consequence of the nature of the keep, which is very material, as it is often

SHEEP.

often by no means inconsiderable, especially in certain circumstances and situations towards the close of the lambing season.

In some places it is not unusual, before the lambing takes place, to provide a better sort of pasture-field for the reception of such ewes as may chance to have twin-lambs, as more food is required for them. This is best when in or near the middle part of the lambing pastures, as the ewes and lambs, in that case, can be the most readily and conveniently removed, whereas in other circumstances there is often much trouble and difficulty caused with the young lambs, which should always be marked and removed as soon as they are enabled to walk.

The next preparatory business, in some situations, is that of clatting the ewes, which commonly takes place a little time before the lambing begins; but in many places this is wholly neglected and thought quite useless. See *SHEEP, Clatting of.*

The lambing time takes place at different periods in different places, according to the nature of the situation and other circumstances, and often a week or ten days sooner or later in the same situation, as the season may be more or less severe, and the stocking of the land has been more light or more hard. But about the beginning of April is probably the best and most general time. Early lambing is mostly advantageous, where the circumstances of the land will admit of it. The season of lambing mostly continues about a month, and in some places, where lambers are employed without any lookers, two guineas and the lamb-skins are paid for that time.

In the actual business of lambing, much care and attention are necessary in the person who has the direction and management of it. In all natural cases of this sort the less that is done, perhaps, in general, the better, as nature will for the most part effect the business in the safest and most proper manner. The chief difficulty, it has been said, consists in knowing when ewes should be assisted, as young persons employed in this management are much too apt to interfere, from which much mischief and loss not unfrequently proceed. The nature of the particular case, and the workings of the ewes, should constantly be the principal directors in this matter. Some conceive, that when ewes have been at work some length of time, they should be assisted; others, that when the lambs' tongues are protruded from the mouths, they should have assistance; but neither of these rules is always to be depended upon. There are still others who think, that when the ewes rise and walk off on being approached without any thing being the matter, they require no interference; but that when they will not rise, but appear a good deal spent, they should have immediate assistance. Some also suppose, that considerable force may be exerted in such cases without danger. But though there may be some truth in the remark, it is always necessary that much caution should be taken where force is employed on these occasions. Besides these, something may probably depend upon the state of the seasons in this business, as assistance will be less necessary in such as are cold, than when they are warm. The ewes should, in fact, never be meddled with in their lambing, in these cases, until there is an absolute necessity.

In all unnatural cases of this kind, which vary very much in different instances, according to the nature of the unusual part of the lamb which may present itself, and which require the assistance of proper persons; those who have had the fullest experience, and are the most cool and cautious, will be the most proper for performing the business, as where this is not the case, there will often be

great loss of lambs, as well as of ewes. In every case of this nature, where much force, or any other means are necessary to be employed, very great care and circumspection should constantly be used to have it exerted and done in the most gentle, deliberate, and safe manner possible, as otherwise much danger and inconvenience may arise, that might have been avoided.

In some instances, where the lambs are apparently dead when they are lambled, they may be recovered and restored by forcing air into their lungs in an easy manner. This should however always be done almost instantly afterwards, otherwise it seldom succeeds.

As soon as the lambs are brought forth, they have commonly some milk from their mothers given them, or are allowed to suck them for some little time, which are supposed to increase the affection of the ewes for them; the lambs being at last left as close by the noses of the ewes as possible, which should be done quickly, that they may not go away without noticing them. The lambs are always greatly strengthened and improved by the ewes licking them, which they constantly do, where they have a proper affection for them. When lambs droop and hang their heads immediately after they are lambled, they are bad and unfavourable signs, as shewing them to be in a weak and dangerous state. The practice often made use of in some places, of putting the tail of the lamb, which is just lambled, into the ewe's mouth, in order to promote her affection for it, is very silly, and of no avail.

In the catching of all ewes in the lambing state, every sort of exertion, trouble, and fatigue, so as to injure them, should be avoided as much as possible, in order that they may lamb, or be assisted to lamb, in a cool suitable state.

During the time of lambing, the looker, or other person who has the management, should be very careful and attentive early in the mornings, and at other times, in looking over the ewes and lambs, to see that they are not injured or lost by neglect in any way.

In cases where this business is carried on upon a large scale, when every thing has been properly prepared and got in readiness, the lamber, or other person employed in the management, begins his laborious and difficult undertaking, by entering and going over the lambing pastures at the time of day-break, with his lamb-hook in his hand, that he may notice and examine the ewes, raise up such as have lain down, and determine whether such lambs as are dropped be capable of sucking, which is commonly readily decided by the distension of the belly. In cases where this last is not able to be done, the ewes are either caught, and the lambs suckled, or the lamber is provided with some ewe's milk in a bottle for the purpose, a precaution which is essentially proper on many occasions, as when the weather is severe, wet, and stormy, in which circumstances the lambs quickly perish, if not supplied with such food. This attention often strengthens the lambs in a wonderful manner, and prevents much trouble in removing them and the ewes to the pounds. The continuance of the affection of the ewes is proved by the callings and noise they make. The twin lambs are now usually marked, to prevent confusion, as the ewes frequently leave one of them, after which they are not meddled or interfered with for some little time, as a few hours, or a day, as their strength may be; but as soon as they can walk, they are mostly removed with the mothers into better keep. The ewes which have single lambs commonly remain in the pasture-fields where they have lambled, unless the number be great, in which case, the lambs with the ewes are occasionally removed into the pasture-fields, where they are intended to be kept during

SHEEP.

the summer. It is supposed, that by the above practice the lambing pastures are sometimes less discommoded, than is the case where too great a number of ewes and lambs are crowded together. Sometimes, when an ewe has lost her lamb by any accident, and yet is deemed capable of bringing one up, a twin lamb is given her. When a weakly lamb, however, is put to an old ewe, the milk is often too strong for it, and will speedily cause its destruction, by scouring or in other ways; such lambs are likewise incapable of keeping the udders of the ewes properly drawn, by which means much injury is frequently done to them. These ewes are therefore often better turned off for fattening, than being employed in this way. Various methods are practised with the ewes which have dead lambs, by using such lambs so as that their affections may be increased, and the ewes be drawn into the pounds, and have other lambs put to them. All such measures, however, often fail. The custom of running the ewes down to get them into the pounds is always very bad, as frequently causing their destruction. The ears of ewes being flapped down, and the ewes not looking back, are in every case bad signs of affection, but the contrary good ones. Lambing pounds are mostly supplied with suitable pens or coops for the convenience of suckling the strange lambs in. And the coats of the natural lambs are sometimes employed on the others. Whatever is done in this way, must, however, be done by deception, and not force, as the ewes are very refractory. Many other modes are had recourse to in different cases for taming the refractory ewes, and causing them to suckle the lambs in a proper manner.

It will now be necessary for the lamher to be particu-

larly careful of the twin and other lambs, to see that they are regularly kept, and properly suckled in all cases, especially those which are in a weakly state. For this purpose some milk of the cow or other kinds is often carried and made use of by him, which prevents trouble afterwards. In these intentions, it is proper to go over the fields twice or oftener during the day; and to be particularly attentive in cold stormy weather. All sorts of accidents and dangers are at these times to be looked to, and guarded against in the most cautious manner.

About the end of the first week of the lambing season, one-half of the ewes will mostly have lambed, and more than two-thirds of them probably at the termination of the second, when the ewes may be brought into a less compass, and the lambing-field or pasture be cleared of all the twins and most of the single lambs, and they which are necessary may be had ready to cut, which in suitable circumstances is often done at this early period, by which the manager will be freed from much of his future labour and trouble.

By this sort of cautious attention and management in the lambing of the ewe flocks, and the use of proper sorts of shelter, a vast saving of lambs and ewes may in all cases be made, and the interests and profits of the sheep-breeding farmer be very greatly aided and promoted. See SHEEP.

SHEEP, *Names of*, the several names which are given, applied, or appropriated to them, at different ages, in different parts and places where they are much kept. These are very numerous, and of a very local nature; but the following are the greatest part of them.

	Males.			Different Sexes.	Females.		
Times.	Borders of Scotland.	Lincoln.	Dorset.	Norfolk and Suffolk.	Borders.	Lincoln.	Dorset.
From that of being lambed until that of weaning	} Lambs.	} Lambs.	} Purs.	} Lambs.	} Lambs.	} Lambs.	} Chilvers.
From that of weaning until that of the first clip							
From that of the first to that of the second clip	} Dinmonts.	} Heeders.		} Shearlings.	} Gimmers.	{ Gimmers and Sheeders. }	
From that of the second until that of the third clip							} Young Wedders. }	} Two-shear.	} Counters.
From that of the third clip forward	} Old wedders.		} Three-shear.	} Fronters.			
From that of the fourth clip ever afterwards					} Full-grown sheep. }		} Ewes.
Such ewes as are broken mouthed and refuse are denominated	} Crones in Norfolk and Suffolk.						
	} Drapes and Drape ewes }				} in Lincolnshire and some other counties.		
Such ewes as are neither with lamb nor give milk, are said to be	} Eild, or Yield in Scotland.						

These arbitrary names, which are given to sheep at different periods of their existence, in different parts of the country, serve to guide the breeding and grazing sheep-farmers of such places in their management with these animals.

SHEEP, *Smearing of*, the practice of salving or laying them over with some sort of substance of the unctuous kind, for the purpose of improving the wool, and preserving the animals from disease. It is only had recourse to in some districts, and those mostly in the northern parts of the kingdom. See SALVING of Sheep.

Raw unboiled tar, not mixed with butter, is sometimes

very dangerous and hurtful to sheep, especially rams, when laid on in large, or even moderate quantities. There are, indeed, some sorts of tar which are very acrid, and blister sheep, causing the wool to fall off, and the death of the animals. When it is thin, and appears black on stirring, with an offensive smell, and caustic acrid taste, it should never be used for sheep, especially without boiling, to destroy such properties. The persons engaged in the work of smearing often find proofs of the danger of this sort of tar, in the burning effects which it has on their fingers. Good smearing tar, it is said, on being stirred, has a thick, brown, ropy

SHEEP.

ropy appearance, and a more pleasant smell, with a less acrid taste than the other kind. Tar should probably always be well mixed with butter in performing this sort of work.

SHEEP, Teeth of, the parts of the mouth of these animals by which their ages are often, in some measure, ascertained. When full-mouthed, they have usually eight teeth of the incisor kind in the lower jaw. They throw up two such each year until this takes place, by which means their sucking teeth are displaced or lost. See *AGE of Sheep*, and *TEETH*.

SHEEP-Shearing, in *Rural Economy*, the business of clipping or cutting off the coats or fleeces of sheep, by means of shears constructed for the purpose, which are termed *wool-shears*. It also sometimes signifies the season in which this sort of work is usually performed, which was formerly, and is even in some cases at present, a sort of festival. The operation is performed in different ways by different persons, but the best mode is that of the circular, or round the sheep, instead of the longitudinal, which is at present most in use. It is usually performed about June or July, according to situation and season, but should not be done either too early or be too long protracted, as injury and inconvenience may attend either extreme. A good clipper is capable of clipping from seven to fourteen or fifteen, and up to twenty or twenty-five in the day; and more are frequently done by very expert persons. Great care should be taken not to cut or prick the animals; but where this accident happens in the northern parts of the kingdom, they touch the part with a little tar, or sheep-falve; and in Sweden it is often done with train-oil and resin melted together. And in addition to what has been already observed on this subject, it may be stated, that much improvement has taken place in this art, especially in the more southern districts of the kingdom, in making use of the mode of clipping round the sheep, which has gradually extended itself from the northern districts of the island; by which less wool is lost by being left upon the sheep, and the business performed in a more expeditious, neat, and convenient manner. It was much the practice formerly to clip lengthways of the sheep, and in some cases in many different directions, according to the convenience of the person who executed the work, by which means it was often ill done. And in Ireland it has been stated, that they clip in short strokes, catching a bit of wool first in one place and then in another; and that if they are not looked narrowly after, they will leave many parts, such as the heads, tails, and insides of the thighs, untouched.

We have, in speaking of sheep, noticed the most proper periods of performing this very important operation; and the following remarks, by Mr. Price, an excellent sheep-farmer in the county of Kent, with the comments of Mr. Culley, as stated in the *Annals of Agriculture*, will shew the proper mode of managing the sheep in the time of shearing, as well as the manner of executing the business with these sheep-masters. It is stated by the former, that the sheep-shearing in Romney-Marsh commences about Midsummer, and finishes about the middle of July. Those who shear first, think they escape the effects of the fly, and those that shear late, apprehend they gain half a pound weight in every fleece, by the increased perspiration of the sheep. In early shearing the wool has not the condition which it afterwards acquires, but the hot weather occasions a good deal of trouble in detecting the fly. In order to begin, a large pen is filled with sheep ready for the coming of the shearers, in number from four to twelve, in proportion to the extent of the flock. The time employed is from two to four days. The sheep are let into a small pen, thirty or forty at a time, and when taken out to be sheared, all except three, more are

put in, because one or two only left would be apt to jump out. A boy keeps the gate, and the account of the number sheared, with small leaden tellers. These shearers by profession differ much as to quantity and method of performance; never begin early, but are satisfied with eight or ten hours shearing: a good shearer will shear ten an hour, a bad one seven. Their emulation tends only to dispatch and profit, not excellence of performance, and the sheep are too often pulled about in a rude and barbarous manner, and even wounded by the shears with cuts of the length of three or four inches, and the wool left unevenly shorn: tar, or some ointment, is then applied carelessly by the boy, in order to keep off the flies. The master's office is usually to give the pitch-mark, and when one field is finished, the sheep are returned, and others are in readiness to take their place.

The common mode of *catching* the sheep is by the hinder leg, drawing the animal backward to the adjacent shearing-place, the hand holding the leg to be kept low; when at the place it is turned on its back. Or they are moved bodily, or one hand placed on the neck, and another behind, and in that manner walked along; the first, or common mode, he thinks the most safe. The parts of sheep fed on rich pastures, and fleshy, if handled hard, and bruised, are liable to fatal mortifications; an accident which often happens, on which account the pens upon some lands are obliged to be lined with woollens, or many would die from bruises. The price of shearing is 18*d.* or 2*s.* a score, with a dinner, and 2*s.* 6*d.* or 1*d.* a sheep without victuals, but with drink. They vary much in different places. A good winder will wind 400 fleeces a day, at the same price *per* hundred as the shearer has *per* score. The method of shearing—the left side of the sheep to the shearer's left leg, his left foot at the root of the sheep's tail, and his left knee at the sheep's left shoulder. The process commences with the shears at the crown of the sheep's head, with a straight cut along to the loins, returning to the shoulder, and making a circular shear round the off-side to the middle of the belly; the off hinder leg next: then, the left hand holding the tail, a circular shear of the rump to the near *huck* of the sheep's hind leg; the two fore-feet are next taken in the left hand, the sheep raised, and the shears set in at the breast, when the remaining part of the belly is sheared round to the near fluke; lastly, the operator kneeling down on his right knee, and the sheep's neck being laid over his left thigh, he shears along the remaining side.

However, on these statements Mr. Culley has made the following practical comments; namely, that Mr. Price's observation is just, with regard to the benefit arising to wool from being late clipped, and that it is consonant with the opinion of the Lincolnshire graziers and breeders, who have paid more attention to the subject, and understand it better than any other of the profession in this island: but very great attention is required from the shepherd to keep the sheep, under the circumstances of late clipping, free from the fly and maggots, also from the danger of being *beaten* by small flies, which fasten on those parts where the points of the shears have made the smallest scratch. But that, in regard to shearing seven or ten sheep in an hour, nothing can be more absurd and improper than such attempts, since it is impossible for the best shearer to clip the lowest number within the time, and perform it well, as it ought to be done. Forty years ago, the same absurd practice prevailed in Durham, and particular men would clip sixty or seventy of that large breed in a day; but the consequence of such improvident haste was, that besides imperfect shearing, large pieces of skin were cut, particularly from the bellies of the sheep,

SHEEP.

which, being constantly pestered and tortured in those parts by the flies throughout the summer, suffered much injury in their health and condition, some of them never recovering. Several sheep have died immediately after shearing, owing, perhaps, to having their legs tied, which, with hurrying and tossing them about, brought on a colic or cramp, putting a period to their existence in a moment. At that time, in a flock of two hundred sheep, we seldom escaped without the loss of one or two in a season; since, in the clipping of three thousand and upwards annually, we have not lost one these seven years. But, says he, instead of *tying* their legs, and *trying* who could clip the *most per hour*, or *day*, we have wisely begun to *try* who could clip the *best*, and from that change of system, instead of clipping fifty sheep *per day*, we think it a fair day's work to clip twenty-five upon an average. Where sheep are clipped by the great, and the men paid for number done, thirty or upwards may be sheared in the day; but our's are done by the day, without hurry, and scarcely wounding a sheep in the day. Each shearer makes his peculiar mark on the sheep, red or blue, that bad shearing may be detected; an useful stimulus to exertion. And he thinks that the sheep may be caught by the hinder leg, above the hough, but *not by any means* drawn backwards; on the contrary, as soon as the catcher has caught the sheep by the hough, he should draw it backwards, until he can, with his left hand, reach the throat, then, with the right hand behind its tail, he conveys it along with ease and safety. He thus continues: thirty years ago, it was the general practice in this county (Northumberland), and some old-fashioned bigotted people adhere to it still, to shear the sheep thus; the clipper first opened the belly, and then, after tying all the four legs, fat down upon a sack filled with straw, the sheep lying between his legs; when, in the most awkward manner, he slashed and tore the fleece off, beginning at the neck, and going down the left side first, finishing at the right. Instead of clipping around the sheep, as at present, they then clipped them mostly lengthways. The present method is to begin at the back part of the head, in order to give room for the shears to make their way down the right side of the neck, to the open of the breast. The man then sits down upon his right knee, laying the head of the sheep over his left knee bent, and beginning at the breast, clips the underside of the throat upwards to the left cheek; then takes off the back of the neck, and all the way down below the left shoulder. He then changes to the contrary side, and makes his way down to the open of the right flank. This done, he returns to the breast, and takes off the belly, after which it matters not which side he clips, because being able to clip with either hand, he meets his shear-points exactly at the middle of the back, all the way, until he arrive at the thighs or legs. He then places the sheep on its left side, and putting his right foot over the neck, and the other forward to the undermost hind leg, clears the right side; then turning the sheep over, finishes the whole.

Our price for clipping used to be one shilling *per dozen*, and a gill of ale about ten o'clock, and another at four in the afternoon. He supposes a man will have one shilling and sixpence *per dozen* now; but *we* clip all with our own men, mostly the shepherds, many of whom now do it most admirably; and we have in general prevailed upon them to clip with either hand; which is not only the easiest for the clipper, but enables him to do his work in the neatest and most complete manner.

These remarks deserve the regard of the sheep-farmers in other districts, as well as the following hint by Mr. Price. It is, says he, astonishing to see a good shearer handle a

sheep; he studies its ease, and the sheep seems delighted in its situation. This should always be the case with these animals, which are often much injured by coarse management, and the most sober steady men be constantly employed.

The fat sheep should always be shorn earlier than those which are lean. In the South Down sheep district, a good sheep-shearer is said to be able to shear fifty sheep daily, for which he has 2s. 6.; or 1s. the score, and board. Great care should at all times be taken not to injure the sheep in shearing, as the least cut is sometimes dangerous, though at others not. In cases of cuts, wax ointment or well boiled tar must be used, and the sheep have an open airy pasture.

The very same method is taken in shearing the lambs as in that of the old sheep, which, in many districts, takes place nearly at the same time, or about the latter end of June and the beginning of the following month; some shearing them immediately on their being weaned, but others some little time before, for the sake of allowing the old ewes to become fat. See *SHERLING of Lambs*.

The writer of the "General Treatise on Cattle," states, that the royal flocks of fine-woolled sheep in Spain are sheared in the beginning of May. There are shearing-houses, each of which will contain twenty thousand sheep, and cost in building above five thousand pounds sterling. To shear a flock of sixteen thousand sheep requires one hundred and twenty-five men, a man shearing twelve ewes, or eight rams, in a day. The sheep are sweated previously to being sheared, in a long, narrow, low gut, called the sweating place, where they remain a night, crowded as close together as the shepherd can keep them. The shorn sheep are permitted to go to pasture if the weather be fine, returning home in the evening, to pass the night within shelter of the walls, or in the house, if cold or cloudy; by which means they are brought by degrees to endure the open air.

And it is a point of great consequence in this business to have a person well conversant with the winding of the wool, in order that it may be well performed, and look in a proper manner to the buyer. In some places the wool is laid in a heap on being wound, and conveyed in the evening of the same day to the wool-lofts, or other depositaries. Some store their wool constantly in upper chambers, as the moisture which is produced by it on ground floors, when it is continued there for any length of time, is supposed to be very injurious to it. See *WOOL*.

SHEEP-Fold, in *Agriculture*, a space of arable or other land hurdled in for the purpose of being manured, or a sort of yard or other contrivance for the purpose of confining and keeping sheep in during the nights or in bad weather, in order to afford them protection and shelter. They are sometimes fixed, being constructed of any convenient sort of light materials, so as to inclose a space in proportion to the number of sheep in the form of a kind of yard or fold, which is kept constantly well littered with some sort of dry substance, such as stubble, refuse straw, dry sand, &c. during the time the sheep are folded and foddered in them, in order that as much manure may be raised as possible. In some cases also, for the more perfect protection of the sheep, they have sheds all round them, under which the sheep may lie without injury from rain, snow, or any sort of moisture. These are usually termed *standing folds*, and are either formed about the home-stalls, or in some dry, rather elevated situations, on the farms, having the bottoms well laid with some sort of material that is capable of keeping the sheep dry and clean. And in the *covered fold*, or what is termed *cotting*, which is in use in Herefordshire, they are sometimes formed into different divisions, so as to contain certain numbers or kinds of sheep.

They are, however, in other cases formed so as to be moveable,

SHEEP.

moveable, either by means of wheels or other contrivances, being drawn to different situations according as they may be wanted. See *SHEEP-House*.

There is likewise another sort of more imperfect sheep-fold, which is formed by the planting of trees in different methods, so as to afford the animals a sort of protection from the severity of the winter season, as well as from the excessive heats of the summer. These are termed *tree-folds*, and sometimes *plantation folds*, from the manner in which they are formed. See *TREE-Fold*.

In the construction of the second sort of sheep-folds, which were mostly formed in some distant parts of the farm, in which cases they were often denominated *standing-out folds*, a cheap and simple method was had recourse to by an excellent sheep-farmer in Suffolk (Mr. Macro). He inclosed a double fold with thirteen dozen of old hurdles seven feet long each, formed of wands, and raised a haulm fence around them, composed of upwards of sixty loads of wheat stubble, the area of the fold being littered with about thirty loads more: in this the flock were to be lodged where the field fold was unsafe, or could not be removed from place to place, on account of frost, snow, or flood; and it is stated, that he made during the same winter season, 493 loads of manure, improving at the same time the condition of his flock. The land, it is observed, lay at too great a distance to be manured from the home-stall. He likewise adds, that before he thought of this plan, his sheep were always obliged to lie in bad weather, upon a certain sheltered part of the heath, where the fold manure was not only lost to his farm, but the grafs on which the dung was heaped in such quantity became so coarse and four, that nothing would eat it; and that, exclusive of this injury, he used to lose by mortality, in a wet or severe season, during yearning time, a much greater number of both sheep and lambs, for want of the dry, warm lodging of a sheltered fold, the advantage of which he estimated at thirty or forty pounds a-year at least. He saved not less by his improved plan than thirty lambs in a year, besides sheep amounting to a greater number of lambs than he usually reared in one year during the period of his farming business.

And by the forming of these folds in any other cheap convenient manner, similar benefits may be derived by the sheep-farmer.

In all these cases the sheep should be littered down as above as often as necessary, and be well fed, twice in the day at least, with such food as has been provided, being let out during the middle of the day, except when the season is very stormy and severe. It is stated in the *Annals of Agriculture*, that one hundred and thirty-four sheep confined in this way for the period of six weeks, and littered with five loads of forty trusses each of oat-straw, forty pounds to the truss, made twenty-eight large loads of manure, consuming two acres of turnips within the time.

The great superiority of this sort of fold over that of the naked moveable kind, is therefore sufficiently obvious, and may probably be had recourse to at all seasons with some advantage. See *SHEEP*, and *FOLDING of Sheep*. Also *SHEEP-Yard*.

A sheep-fold has been lately invented by Mr. Plowman of Broome, Norfolk, upon an improved and very simple principle, combining many advantages over the old and expensive method of folding by hurdles; and as the whole fold can be removed with ease at all times, it will be found peculiarly useful in feeding off turnips on the land in frosty weather, when hurdles cannot be used. It is stated that the expence, in the first instance, will exceed that of hurdles, for the same given quantity of sheep; but having had

one in use nearly three years, he is satisfied the saving will be very considerable: for, before he adopted this method of folding, he lost from thirty to forty nights folding in the year, owing to the land being hard in dry seasons; which renders folding almost impracticable, as they never can be set without great labour and destruction of hurdles. He is also clearly of opinion, that the stock of sheep will be greatly increased when this method of folding becomes more known; and that it will enable many small farmers to keep from 50 to 100 sheep, who are now deterred from it on account of the small quantity of feed they have not answering to keep a man for that purpose only; but by this plan, they may keep a boy at 3s. or 3s. 6d. per week, who can attend on 100 or 200 sheep, and move the fold himself without any assistance. In heavy gales of wind it frequently happens that the hurdles are blown down, and the sheep of course being at liberty to range over the crops do incalculable mischief, which cannot happen with this fold. And in some counties in England, where hogs are folded, great difficulties are experienced for want of stowage, for them to feed off winter tares, &c. &c. as they root up every stake or hurdle; and having tried the experiment, he is certain this fold will keep them in, and defy their attempts to displace it. And an astonishing quantity of time is saved, as a man can remove a fold to contain 300 sheep in five minutes, which by the old method frequently takes some hours to accomplish. Many are now using folds from his model; and he received for the invention the gold medal of the Society for the Encouragement of Arts, &c.

It is further remarked, that where the fold is wanted to be used on very hilly ground, it must be begun at the top and worked down to the bottom for the ease of removing it, and then drawn up again with a horse. This, however, he has never had occasion to do, for his land is ploughed in a contrary direction, and he works the fold in the same course as the ridges. By this means the inconvenience is avoided of crossing the furrows; and they are also a guide to keep the fold in a straight direction. With respect to the sheep getting under, he does not recollect that circumstance to have ever happened, nor does he conceive that any land, which is cultivated, can be so uneven as to admit of it.

This sheep-fold is twenty-one feet in length and three feet eleven inches in height, being composed of a top-rail, and bars below passed through uprights; the whole moving on low cast-iron wheels, and made strong, but in a light manner.

SHEEP-House, a sort of slight wooden building, constructed for the purpose of containing and protecting sheep in bad weather, &c. Houses of this kind are usually made low, for the sake of warmth in the winter, being mostly a third part longer than they have breadth; they should also be sufficiently large for the quantity of sheep they are to contain. The sides should be lined with boards, and the bottoms be laid in an even manner with stone or some other material, that the litter may be well impregnated with the urine of the sheep. And it has been advised to have the sides exposed to the sun, set with lined moveable hurdles, that when it shines the whole may be laid open, to afford due refreshment, and give the sheep an opportunity of feeding upon the pasture wherein they stand. They should be well and securely covered with some sort of proper material upon the tops. They are sometimes fixed in particular situations, but in other cases, which is the more improved method, so constructed as to be capable of being removed as they may be wanted. One of the latter kind, employed on the farm of the Hon. George Villiers, in Hertfordshire, which is very complete, is described, with a plate, in the *Corrected Agricultural Sur-*

SHEEP.

vey of that district, lately published by the Board of Agriculture.

In this sheep-house the wheels are fixed to the sides, being sixteen inches in diameter, and having an axle-tree to harness the horse to, with weather-boarded flaps hung with hinges, to turn up and button against the sides when it is removed. It has also folding doors to open when the sheep are let in or out, and fixed weather-boarding, with cover-boarded windows to open on hinges sideways, in order to put fodder into the racks. Likewise a canvas roof, with open railing for air.

It is observed, that the length of the building is from twenty feet to any length; the width to be such as to enable the building to pass through the field-gates; the weather-boarding and flaps to be made as thin as possible, and covered with pitch.

But how far the advantages of houses of this sort may compensate the expences of constructing and keeping them in repair, has not been fully shewn; nor has perhaps a sufficient number of trials been made to shew the benefit of confining sheep in covered houses or folds, or whether the economy of the animals is well suited to such a system. Some circumstances of advantage attending the practice of housing sheep have certainly been stated, but no satisfactory comparative experiments have, so far as we know, been made. And from the plan being little or not at all adopted in many extensive sheep districts, and in others where it once prevailed being either wholly in disuse or much on the decline, as is well known to be the case in Gloucestershire and the county of Hereford, there seems reason at least to presume that it is not so necessary or so well suited to the habits of the animal, nor even so beneficial as has been supposed by some writers on the subject. See *SHEEP*, and *FOLDING of Sheep*.

Houses of this nature, for the purpose of sheltering sheep and lambs in bad weather, are formed in a very cheap and simple manner in Romney-Marsh, as may be seen in Price's account of the sheep-husbandry of that district.

SHEEP-Hurdles, the flakes or sort of fence-gates which are set up so as to confine sheep at the time of folding them on arable land, or while they are feeding down, or upon any particular sort of food. They are of several different kinds, and either close or open; but the former are in general to be preferred, as affording the most shelter. It is obvious that the number required to inclose a certain space must depend upon the length. See *HURDLE*.

SHEEP-Husbandry or *Farming*, that sort of farm management which relates to or has sheep for its principal object. There are various modifications of this sort of farming, depending upon the differences in the circumstances of the lands, their nature and situations, as well as other local matters. See *SHEEP*.

It is not improbable but that in this sort of husbandry and farming, the most benefit and advantage may often be derived where there is a judicious intermixture and conjunction of other sorts of management, as those of cultivation, cattle, planting, and some others, sheep being constantly the great object. By such means advantages are afforded and brought forth in a great variety of different ways to the individuals themselves as well as the community at large.

In this sort of farming management it is of much consequence to have recourse to the fixing upon such plans and methods as are the best and most suited to the state and nature of the farms and markets for the sales of the animals. In cases where the farms are high, and of a cold exposed nature, the wether system may often enter largely into the

plan which is to be adopted. Where they are of the more mixed nature, and consist of high, as well as low lands, they may sometimes be most suitably stocked, in a partial manner, with ewes and lambs, and with wethers. In those of the more common sort, the breeding or rearing systems, according to circumstances, may frequently be the most profitable modes. And in rich grass land and mixed farms, which are provided with parks and pastures, as well as arable lands, the sheep-farmer may not unfrequently be tempted to fatten the saleable part of his sheep-stock, particularly where the markets are convenient for him in respect to distance.

In all these sorts of farms in this kind of husbandry, the breeds or kinds of sheep should always be selected and provided with a perfect consideration of their nature, and the management of the sheep be carefully directed with the same intention. The means of disposing of them should also be well regarded. Many other circumstances likewise require attention in this sort of husbandry and management. The inquirer may find much useful information on the subject of Highland sheep-farms and sheep-farming, in the third volume of the "*Transactions of the Highland Society*."

SHEEP-Marks, and *Marking*, the marks and means of performing those which are put upon sheep in different ways and manners; as by means of tar, ochre, redde, wad, and other similar substances, and by cutting the ears of the animals in different forms and methods. These are useful and necessary to the sheep-farmer on many occasions and accounts; they serve to distinguish his particular sheep and flocks from those of others, to discriminate the several different kinds, and to point out the various sorts of management which are necessary with different kinds of sheep and lambs, as well as to answer different purposes in the sale of them, &c. In the marking with tar, a tool or contrivance having letters fixed to the end of it, is mostly made use of, the initials of the name of the farmer being most commonly employed. With the other matters different methods are taken; such as wetting and rubbing them on slates, stones, or other matters, and then marking the sheep with them in the ways that may be thought necessary. Sheep and lambs are marked by these means in many different parts, as in the faces, on the sides, the hips, and in several other places; the work being mostly done according to the fancy of the person engaged in it, or of the owner of the flock, often in different curious modes and forms, as straight lines, curves, circles, and a variety of other more out-of-the-way methods. The marking of the sheep in the ears is performed by cutting them with a sharp knife in different forms and manners, as in that of a fork, an under and upper slant, an under and upper square, an under and upper notch, a staple, an under and upper slit, straight slit, a crop, a crop and slit, a hole, a hole and slit, &c. All these several modes may be seen represented in Price's System of Romney-Marsh Sheep-grazing.

Marking sheep in the ears, in these or other methods, forms excellent and correct means of distinction, for knowing them by, in a variety of cases and circumstances in sheep-farming.

Dr. Lewis recommends the following composition for marking of sheep; *viz.* melted tallow, with so much charcoal, in fine powder, stirred into it, as is sufficient to make it of a full black colour, and of a thick consistence. This mixture, being applied warm, with a marking-iron, on pieces of flannel, quickly fixed or hardened, bore moderate rubbing, resisted the sun and rain, and yet could be washed out freely with soap, or ley, or stale urine. In order to render it still more durable, and prevent its being rubbed off, with the tallow may be melted an eighth, sixth, or fourth of its weight

SHEEP.

weight of tar, which will readily wash out along with it from the wool. Lewis's Com. Phil. Techn. p. 361.

SHEEP-Pens, the divisions made by the small moveable gates or hurdles, which are set up to keep sheep in some particular situation. They are usually formed on a dry place, about the corners where different inclosures of the pasture kinds meet, so as to be convenient for the whole. They are useful in examining and selecting the sheep, being divided so as to contain about three dozen sheep each, as by this means they are always at the command of the shepherd for any purposes he may have in view. The bottoms should be firm and dry, so that the sheep may not be soiled.

Pens or coops are likewise made and used in the pounds where the ewes are lambled or put, in some sheep districts. These are usually about two feet seven or eight inches in the square, into each of which one ewe and the lamb are put, and suckled, where there is a disinclination in the ewes to let their own lambs suck, as occasionally happens, and where strange lambs are put to them. Two of the side-boards of these pens are capable of being lifted up and let down so as just to admit the ewes; in which they move with difficulty, consequently are not able to reach the lambs to beat them away; by which means they thus find an opportunity of sucking against the wills of the ewes. These pens are therefore often very convenient in these cases, two of which are mostly kept in each lambing-ground or yard. See **SHEEP-Pound**.

SHEEP-Pound, any sort of narrow inclosure for the confining of sheep. Pounds of this kind are of many different sorts, and useful for several different purposes in the management of sheep-flocks, as those of lambing, catching, sorting, and dressing them in different ways, &c. They sometimes occupy pretty large spaces of ground, but at other times are only of very small extent.

SHEEP Rubbing-posts, the small posts and pieces of wood which are fixed up in sheep-pastures for them to rub themselves against. They are sometimes simple upright posts, but at others they have cross pieces put through them. They are very necessary and useful to the animals. See **RUBBING-Post**.

SHEEP-Shears, the shears used in clipping or shearing of sheep. They are frequently termed wool-shears. They are made with a spring bow in the handle part, which causes them to open readily in working with them. The handle part is mostly about six inches in length, and that of the blade about five; but shears of this kind vary much in size in different places.

SHEEP-Skin, or **Pelt**, the common covering by which the sheep is surrounded and defended. The skins of these animals differ much in thickness, size, and other properties, according to the nature of the different breeds. Sheep pelts, or skins, sometimes form an article of great utility and profit to sheep-farmers, being sold to the fell-mongers, or other persons in their neighbourhood, under constant contracts by the year, at different prices; as from the time of shearing to Michaelmas, at from 1s. to 1s. 6d.; from that until Shrovetide, at from 2s. to 2s. 6d.; and from Shrovetide to shearing-time again, at from 3s. to 3s. 6d. Something of this method is pursued by the South Down sheep-farmers in the sale of their sheep-skins, as well as by those of several other great sheep districts, by which great advantage often arises.

SHEEP Washing-Hooks, the long-handled hooks which are made use of in washing sheep in some places. The hooks are in these cases fixed at the small ends of the long handles, in several different forms, as in that of somewhat the manner of an S; that of two small sorts of half circles, with a little

straight portion in the middle, to which the handle is joined, and, in short, quite straight portions. They are very useful, in some instances, in guiding and directing the sheep in this business.

SHEEP-Yard, any sort of inclosed yard or place in which sheep are confined and kept, either for the purpose of bringing forth their young, feeding, or fattening. These sorts of yards are now becoming pretty general in many sheep districts, as well as some other places. They are made in several different ways, according to the nature of the situation and other circumstances; and are often capable of being formed in easy, cheap, and convenient methods. See **SHEEP-Fold**, and **SHEEP-House**.

It is stated in the Agricultural Report of the County of Oxford, that at Clifton, Mrs. Latham has one of the most complete sheep-yards in it: a shed surrounds three sides of it, in which are racks and troughs for the sheep to take their food from; it is thirty-one yards in length and sixteen in breadth; the sheds being five yards broad. This sheep-yard does very well for two hundred ewes. The ewes are usually brought into the yard from four to six weeks before the lambing-time, and continued in it until that is over, going out however in the day-time. This is said to be considered as a very excellent method, but attention must be paid in it, that the dung does not accumulate, as by its fermentation the sheep are liable to be injured. It should, of course, be carted out in a repeated manner. When not removed so often as to prevent its taking on heat, it has also been found, in Essex, to prove dangerous to lambing ewes, as well as ewes and lambs.

The sheds may be raised on the sides of these yards so as to serve as fences also. Stubble, haulm, and other similar matters, may likewise be made to form warm walls as the outside fences of them.

All yards of this sort should be kept constantly well littered with suitable substances of that kind, upon foundations laid with good earth, sand, or some other proper material.

In some large sheep districts, as the South Down, in Sussex, the farmers have sometimes two or three of these yards, which are well sheltered for the sheep to lie down in at night, in very rainy and stormy weather. In some instances a yard of this nature, including the sheds, comprehends a space of not less than three hundred and fifty-five square yards; the sheds around which are about four yards wide. The whole are kept, for the most part, thoroughly well littered down. They are commonly extremely warm, and found to preserve many lambs in bad weather. The whole of the circumference around them, in some cases, has a rack for containing hay.

In the Dorchester district of the first of the above counties, natural grass being extremely scarce, straw is given in large quantities to sheep, as soon as ever the frosty mornings come on; barley-straw is had recourse to in these yards, or in standing pens; and afterwards bean and pea-straw, which they are very fond of: they pick off the pods and tops, and do very well with these substances. These sorts of straw are occasionally carted to the field for their use; and what they do not consume, brought back to the yards; a practice which is pursued to the saving a great many tons of hay. Such dung as is made in this way is found to be very good.

Peas may likewise be applied in these yards, or other ways, in fattening lambs, the mothers of which are at turnips. They are given in troughs, six or eight weeks after the lambs have been dropped. By the lambs having the liberty of running through the openings in the hurdles, where the field mode is followed, it is often some time before they will take to this

SHEEP.

fort of food, but they mostly come on gradually, until a score will eat a peck a day. Peas are sometimes given in this manner, till they reach six shillings a bushel, and found to answer. A great many sorts of food of these and other kinds may be used with superior advantage for sheep in these yards, and a vast supply of good manure be provided at the same time.

SHEEP-Clatter, in *Rural Economy*, a term applied in some sheep districts to the person who has the care of clatting the ewes just before the lambing-time begins.

SHEEP-Lamber, a name given to the person who has the care and management of the ewe-flocks, which are under the state of lambing, in some sheep districts. It is of very great advantage to a sheep-farmer to have a careful, steady, active lamber, unless he attends to the business himself, which is always the best way where it can be done; as few will be found who are sufficiently attentive and diligent at this period, and, of course, much loss may be sustained. Where persons are hired for this purpose, they should, it is supposed, be rather elderly than young, as being more experienced and less apt to be hasty, as the business is intricate, tedious, and often subject to much trouble, confusion, and disorder, which stand in need of a great deal of patience to have them properly attended to and rectified. If they are, or have been lookers, it is so much the better, but this is far from being always the case, even in the principal situations where sheep are kept. In the great sheep district of Romney-Marsh, it is the custom for the lambers to have the skins of the dead lambs as a perquisite, which are usually sold at about 5s. the dozen. This is certainly a bad practice, as it tends to the making of rogues. The interest of the sheep-master and his servant, which ought to be the same, are separated, as what is the loss of the one is the gain of the other, and much injury and disappointment result from it.

In the above great district for sheep, it is usual for the lamber to go his regular rounds at four o'clock in the morning, and to continue with the ewes until about seven or eight, returning to the fields until dinner-time; then going off again at one, and returning about five; setting off on his last round at six o'clock, when he does not return until dark. There is indeed sometimes so much to do, that he cannot come home above once or twice a day: the lambing should on no account be ever left until the lamber has every thing in a fair way, especially at the time of night.

SHEEP-Looker, the name of the person who has the overlooking and management of the sheep-flocks, in some districts. Persons of this kind should always be of careful, steady, active dispositions; with sufficient experience, and a full knowledge of the different modes of sheep management. See *SHEPHERD*.

SHEEP Lambing-Hooks and Marks, the instruments of the hook and mark kind, which are made use of in laying hold of the lambs, and in marking them, in particular cases and circumstances. In the former the handle is about seven feet in length, the head, or circular open part, three inches in width; the neck, or opening part to it, two inches and one-eighth wide; and the guide, or bill, six inches and a half in length. The latter have the handles about seven inches and a half long, with straight and curved or circular marks at the ends, one inch and three-eighths in length, and one inch and two-thirds in width, inside the circle. These instruments are very useful on many occasions.

SHEEP Hay-Rack, that sort of rack which is provided for the use of sheep in their consumption of hay and other sorts of fodder of the same nature. They are made in many different ways, as open or covered on the tops, and boarded

or barred up a little height at the bottom part, as well as raised on low wheels, or wholly without them.

They are usually from about six to nine feet in length, and about two feet and a half in height; the space for the hay at the top about one foot ten inches, but which is sometimes contracted at the bottom so as for the two sides to come nearly together, standing out in the manner of common horse racks. The openings for the sheep to feed through from three, four, or five inches to seven or eight. The smaller they are the less loss there will be, provided they are sufficient for the sheep getting at the fodder. The bars and boards put at bottom in some sorts of these racks prevent the animals getting into them. When formed with covers and screens for keeping the hay or other food, and the sheep, while feeding, from being wet; they are the most complete, especially if, at the same time, they be provided with low wheels, so as to be capable of being moved from place to place. In small racks, where wheels are put at one end, they can be easily moved about.

These racks are of very great use and convenience on all farms where sheep are kept in any quantity. See *RACK*.

SHEEP Corn-Bin, any sort of trough or bin formed for the purpose of containing the corn, or any other similar kind of food for sheep, either in fattening, or in other modes of managing them. Bins or troughs of this nature are usually contrived in a light manner, so as to be moveable on low wheels; having covers at some height over them, supported from below by the ends and upright pieces in somewhat the roof-form, so that the wet may be prevented from getting to such provisions, and the sheep enabled to feed dry. They are generally made very narrow, but of considerable length, the box or trough for the food having only the depth of a few inches.

Sheep-bins of this sort are very necessary and useful in many kinds of sheep management.

SHEEP-Dung, the manure afforded by sheep, which, by means of proper folding in yards properly littered with straw, stubble, &c. may, in many cases, be increased to a considerable extent, so as to render it an object with the farmer. See *DUNG*, *FOLDING of Sheep*, and *MANURE*.

SHEEP-Drains, a name sometimes given to those small drains which are frequently formed upon the more soft and damp sheep-walks and pastures in different parts of the kingdom, in order to render them in a state of greater dryness. They are often made not more than two feet in width at the surface, and one spit and the shovelling in depth. They are most suited to that sort of wetness where the bottom is of a clayey or tilly nature. Such sort of work can, in some places, often be done at three-halfpence the rood of six Scotch ells. These drains should constantly have a gentle slope or declination across the declivities of the grounds on which they are made.

SHEEP-Farm, that sort of farm which is principally conducted under some system of sheep management. Many situations are suited to some branch of this husbandry, which cannot be converted to the purposes of raising grain or fattening cattle, &c. See *SHEEP*, and *FARM*.

The more dry the lands are, and the more fine and short the grass is which is upon them, the better and more proper and suitable they are, in general, for the purposes of sheep-farms. Where the substratum is of a lime-stone quality, this is mostly the case, in the most favourable degree. But in many instances now, arable farms are likewise sheep-farms, to a very considerable extent; artificial food being grown and raised for the sheep-stock in sufficiently suitable proportions. There is probably much advantage in this combination in all cases in which it can be properly admitted. Sheep-

farms should constantly be formed with great attention to the nature of the grafs, the exposure, and the shelter for the animals. They should alfo be kept dry and in good order on the furface, with every fort of proper convenience for the management of fheep. See *SHEEP-Hufbandry*, and *FARMING*.

SHEEP-Leafe, a term applied to pafture-land appropriated to the feeding or fupporting of fheep; or any fort of pafture-land on which this kind of animal or live-ftock is kept.

SHEEP-Pafture, that kind of dry, firm pafture land which is fuitable for the purpofes of grazing, feeding, and fattening fheep. Many forts of moift land are not at all proper for, or adapted to this ufe, though well fited for fome other forts of farm management.

SHEEP's-Trotters, a refufe material procured from fell-mongers, which is made ufe of in fome places as a manure to be turned into the land. They are bought at about 6*d.* the bufhel, loofely heaped, in fome places, and coft about 2*d.* more in carriage, being ufed in the proportion of from twenty to forty bufhels the acre, being afterwards pricked in to prevent their being eaten by dogs, crows, &c. They anfwer beft on fuch lands as are rather dry, and where the feafon is rather moift. They contain a large proportion of lime, and are often adulterated by being mixed with fand, as well as oak faw-duft; which laft is faid not to injure them. Furriers' cuttings are nearly the fame, and made ufe of in a fimilar manner.

SHEEP's Cove, in *Geography*, a bay on the E. coaft of Newfoundland, between Bay Robert and Port Grave.

SHEEP Island, a fmall ifland near the coaft of South Wales, E. of the entrance into Milford Haven. N. lat. 51° 38'. W. long. 5° 9'.—Alfo, a fmall ifland on the northern coaft of the county of Antrim, Ireland, oppofite to the extreme point of the head-land, between Ballintoy and Ballycattle, not far from the remarkable rock, called Carrick-a-Rede. N. lat. 55° 15'. W. long. 6° 11'.

SHEEP-Fefcue Grafs, in *Agriculture*, a fort of grafs which, while it has been much praifed by fome as ufeful in paftures, has been condemned by others as of little importance from its fmallnefs, and being liable to be burnt up in dry feafons. It is faid to fucceed with lefs moifture than moft other forts of grafs. As forming a close-matted turf, where no great produce is required, it may be found a beneficial plant. See *FESTUCA ovina*, and *GRASS*.

SHEEP-Nofe-Worms, in *Natural Hiftory*, a fpecies of fly-worm, found in the nofes of fheep, goats, and ftags, and produced there from the egg of a large two-winged fly. The frontal finufes above the nefe in fheep, and other animals, are the places where thefe worms live, and attain their full growth. Thefe finufes are always full of a foft white matter, which furnifhes thefe worms with a proper nourifhment, and are fufficiently large for their habitation; and when they have here acquired their deftined growth, in which they are fit to undergo their changes for the fly-ftate, they leave their old habitation, and, falling to the earth, bury themfelves there; and when thefe are hatched into flies, the female, when fhe has been impregnated by the male, knows that the nefe of a fheep, or other animal, is the only place for her to deposite her eggs, in order to their coming to maturity. Mr. Valignieri, to whom the world owes fo many discoveries in the infect clafs, is the firft who has given any true account of the origin of thefe worms. But though their true hiftory had been, till that time, unknown, the creatures themfelves were very early difcovered, and many ages fince were efteemed great medicines in epilepfies.

VOL. XXXII.

The fly, produced from this worm, has all the time of its life a very lazy difpofition, and does not like to make any ufe either of its legs or wings. Its head and corcelet together are about as long as its body, which is compofed of five rings, ftreaked on the back; a pale yellow and brown are there difpofed in irregular fots; the belly is of the fame colours, but they are there more regularly difpofed, for the brown here makes three lines, one in the middle, and one on each fide, and all the intermediate fpaces are yellow; the wings are nearly of the fame length with the body, and are a little inclined in their pofition, fo as to lie upon the body; they do not, however, cover it, but a naked fpace is left between them; the ailerons, or petty wings, which are found under each of the wings, are of a whitifh colour, and perfectly cover the balancers, fo that they are not to be feen without lifting up thefe.

The fly will live two months after it is firft produced, but will take no nourifhment of any kind; and poffibly it may be of the fame nature with the butterflies, which never take any food during the whole time of their living in that ftate. Reaumur Hift. Inf. vol. iv. p. 552, &c.

SHEEP-Scabious, in *Botany*. See *JASIONE*.

SHEEP-Sbunk, in *Sea Language*, is a fort of knot, or hitch, caft on a rope, to fhorten it as occafion requires; particularly to increafe the fweep or length of a tackle, by contracting its runner. By this contrivance the body, to which the tackle is applied, may be hoifted much higher, or removed much farther, in a fhorter time. Falconer.

Thus, if any weighty body is to be hoifted into a fhip, &c. and it be found that the blocks of the tackle meet, or *block and block*, before the object can reach the top of the fide, it will be neceffary to lower it again, or hang it by fome other method, till the runner of the tackle be fheep-flanked, by which the blocks will again be feparated to a competent diftance. See *RIGGING*, *Plate I. fig. 16*.

SHEEPCADE, in *Agriculture*, a name provincially applied to the large fheep-loufe.

SHEEPENT, or *SHEEPS-COT*, in *Geography*, a river of America, in the diftrict of Maine, which runs into the fea, N. lat. 43° 43'. W. long. 69° 38'.

SHEEPHAVEN, a harbour on the northern coaft of the county of Donegal, Ireland, fituated weft of the Mulroy, and feparated from it by a long, and, in fome parts, very narrow peninfula. The furrounding country is mountainous, and thinly inhabited; nor is there any town of confequence in the neighbourhood. Dunfanaghy, near Hornhead, is no more than a village, though ruins near it feem to indicate that it was formerly much larger. The filiceous fand found in this diftrict is of excellent quality for making glafs, and it is carried to Belfast for that purpofe. Under the article *HORNHEAD*, a promontory which forms the weftern boundary of the harbour, we noticed, on the authority of the late Dr. William Hamilton, in the Tranfactions of the Royal Irish Academy, the effect of drifting fands in overwhelming the veftiges of cultivation; and the change thus produced in the appearance of a country. A fimilar effect took place on the eaftern fide, which is thus defcribed by the fame writer. "About a century ago, an elegant edifice, according to the tafte of that age, was built on the peninfula, between the harbours of Sheephaven and Mulroy, which at prefent ftands 'like Tadmor of the Eaft, the folitary wonder of a furrounding defert.' The gardens are totally denuded of trees and fhubs by the fury of the weftern winds: their walls, unable to fustain the mafs of overbearing fands, have bent before the accumulated prefure, and, overthrown in numberlefs places, have given free

passage to this restless enemy of all fertility. The courts, the flights of steps, the terraces, are all involved in equal ruin; and their limits only discoverable by tops of embattled walls, visible amid hills of sand. The mansion itself, yielding to the unconquerable fury of the tempest, approaches fast to destruction: the freighted whirlwind howling through every avenue and crevice, bears incessantly along its drifted burden, which has already filled the lower apartments of the building, and begins now to rise above the once elevated thresholds. Fields, fences, villages, involved in common desolation, are reduced to one undistinguishable scene of sterile uniformity, and twelve hundred acres of land are said thus to have been buried, within a short period, in irrecoverable ruin." N. lat. $55^{\circ} 12'$. W. long. $7^{\circ} 45'$. Transactions of the Irish Academy, vol. vi.

SHEEPCUT, a river of the United States, which joins the Kennebeck E. of its mouth, and is navigable 20 or 30 miles. On the W. side of this river is the excellent port of Wiscasset.

SHEEPSHEAD, a cape on the S. coast of Ireland, between Bantry bay and Dunmannus bay. N. lat. $51^{\circ} 29'$. W. long. $9^{\circ} 45'$.

SHEER, a town of Candahar; 40 miles W. of Ghizni.

SHEER, in *Agriculture*, a term used to signify pure, clean, unmixed, as in the case of grain-seeds, and many kinds of substances.

SHEEP, in *Ship-Building*, the fore and aft curve or hang of a ship's sides or deck.

SHEER-Draught, the plan of elevation of a ship, on which is described the out-boards works, as the sheer-rails, wales, ports, drifts, head, quarter, post, and stern, &c. The hang or sheer of each deck inside, the height of the water-lines, &c. See *SHIP-BUILDING*, Plate I.

SHEER-Hooks, are large iron hooks used when a ship designs to board another.

SHEER-Hulk, is an old ship of war of 74 guns, cut down to the lower deck, or nearly so, and fitted in the following manner, to fix or take out the lower masts of ships in the royal navy, as occasion requires. It has a mast fixed in midships, about 33 inches in diameter, and 108 feet high, supported by shores, the upper shore 87, and the lower shore 81 feet long, and each 19 inches in diameter, their heels resting against the inside, abreast the heels of the sheers, which are three in number, each composed of two pieces, 22 inches diameter, scarfed together in the middle, to make 116 feet in height. The heels rest upon the outside, abreast the mast; the heads unite, and are firmly woolded together, and incline outwards, to hang over the vessel whose masts are to be fixed or taken out. The sheers are likewise supported by a derrick, which is 100 feet long, and 22 inches in diameter. The mast is further secured by shrouds and stays, and the sheers by stays and large tackles, from the mast to each sheer. From the head of the sheers depend two large tackles, by which the largest masts are raised or lowered: the effort of these tackles is produced by two capsterns, fixed on the hulk's deck for this purpose. There is also a less-sized tackle for masting small vessels. See *HULK*.

SHEER-Rails. See *RAIL*.

SHEER-Strake, the upper strake or strakes on the topside in midships. It forms the chief strength of the topside, and is therefore thicker, and continued the whole length parallel to the top timber-line and scarfs at the butts between the drifts.

SHEER-Wales, those strakes of thick stuff in the topside of three-decked ships, which are wrought between the

middle and lower deck ports. Sometimes they are called *middle-wales*.

SHEER-Water, in *Ornithology*. See *SHEAR-Water*.

SHEER-BUCKS, in *Geography*, a town of Persia, in Khorassan; 30 miles S.E. of Herat.

SHEERGOTTY, a town of Hindoostan, in Bahar; 68 miles S.S.W. of Patna. N. lat. $24^{\circ} 30'$. E. long. $84^{\circ} 56'$.

SHEERGUR, a town of Hindoostan, in Malwa; 30 miles N.W. of Ragoogur. N. lat. $24^{\circ} 40'$. E. long. 77° .—**Alfo**, a town of Hindoostan, in the circar of Gohud; 5 miles E. of Narwa.

SHEERING, or **SHEARING**, in the *Woollen Manufactures*, the cloth-worker or sheerman's craft, or office; or the cutting off, with large sheers, the too long and superfluous knap, or shag, found on the surface of woollen stuffs, fustians, cottons, &c. in order to make them more smooth and even.

Stuffs are shorn more or fewer times, according to their quality and fineness.

Some use the phrase *sheering of hats*, for the passing of hats made of wool over the flame of a clear fire made of straw, or spray, to take off the long hairs: others call this *flaming*, and others *singing*. Other hats, as castors, femicasters, &c. are shorn, by rubbing them over with pumice-stone. See *HAT*.

SHEERING, or *Shearing*, in *Sea Language*, a term used for the motion of a ship, when she deviates from the line of the course, either to the right or left, so as to form a crooked and irregular path through the water, either by reason that she is not steered steadily, or on account of the swift running of the tide, &c. in which case she is said to sheer, or go a sheering. Hence, to *sheer off*, is to remove to a greater distance.

When she lies at anchor, near port, &c. by reason of the swift running of the tide-gate, &c. she is often said to be in danger of *sheering home her anchor*, or *sheering ashore*. See *CHEST-Rope*.

SHEER MOHAMMED PETT, in *Geography*, a town of Hindoostan, in the circar of Condapilly, on the borders of Golconda; 21 miles W.N.W. of Condapilly.

SHEERNESS, a sea-port and market-town in the Isle of Shepey, and county of Kent, England, is seated at the mouth of the river Medway, and has derived its origin and importance from this circumstance. In the reign of king Charles II. it was deemed advisable to form a fort here, to protect the entrance to the river; and in 1667 that monarch, with an engineer and other officers, surveyed this spot, and strengthened the works. The Dutch, however, sent a fleet to this point, destroyed the fortifications, and sailed up the Medway, as far as Upnor castle. After returning again from this enterprise, the government directed some strong works to be formed here, because the spot was deemed of great importance. A regular fortress was soon constructed, and mounted with a line of large and heavy cannon: and at the same time several smaller forts were built at different stations on the banks of the river. Since that time Sheerness has progressively been augmented and strengthened by new works, and now constitutes a regular garrison. It is commanded by a governor, lieutenant-governor, a fort-major, and inferior officers: and the ordnance establishment is under the controul of a store-keeper, a clerk of the cheque, and a clerk of the survey. Adjoining the fort is the king's yard or dock, which has been made subsequent to the former. This yard is chiefly used for the repair of ships that have been slightly damaged, and for building frigates and smaller vessels. A resident commissioner,

tioner, with two clerks, a master-shipwright, and other officers, with labourers, are stationed here.

A modern chapel has been erected at the expence of government; but in ecclesiastical rites and privileges this is subordinate to the parish church of Minster. According to the population reports of 1811, Sheernefs was returned to contain 134 inhabited houses, and 96 uninhabited; and the inhabitants, including the convicts in the hulks, and independent of the garrison, were estimated at 1685. The hulls of the ships, called *break-waters*, are occupied by about seventy or eighty families, and altogether present a very singular appearance, the chimnies being raised of brick from the lower gun-decks. The market-day at Sheernefs is Saturday, weekly.

For a long period, the garrison and inhabitants of Sheernefs experienced a scarcity of fresh water, the chief supply being brought in vessels from Chatham; but it was determined by the Board of Ordnance, that an attempt should be made to sink a well within the fort; and the execution of this was entrusted to sir Thomas Hyde Page, an able engineer, whose skill and perseverance were found fully equal to the trust that had been reposed in him. The preparation of the materials, and the boring, to ascertain the different strata, were begun in April, 1781; and the sinking of the well was commenced in June following. The land-springs, &c. which greatly interrupted the progress of the work during the first 100 or 150 feet, were excluded by regularly steining the inside of the well; till, at length, the workmen came to an immense stratum of chalk, which prevented the further necessity of steining, and enabled them to proceed with less inconvenience. They went on, however, with great caution; and having dug to the vast depth of 328 feet, the auger with which they were trying the strata dropt down, and the water rushed up with such velocity, that the workmen could hardly be drawn out with sufficient haste to escape drowning. In six hours it rose 189 feet, and in a few days was within eight feet of the top; and has ever since produced a never-failing supply; for, though constantly drawn from, it has never been lowered more than 200 feet. The quality of the water is fine and soft, and its temperature is somewhat warmer than commonly happens in other wells. From this well, conjointly with that of Queenborough, not only the garrison and inhabitants are supplied, but also the shipping which lie at anchor at the entrance of the Medway. (See QUEENBOROUGH.) Hasted's History, &c. of the County of Kent, fol. 1. 8vo. edit. Canterbury, 1798. Beauties of England and Wales, vol. vii. by E. W. Brayley, 8vo. 1806.

SHEERPOUR, a town of Hindoostan, in Bahar; 43 miles S.S.W. of Patna. N. lat. $24^{\circ}55'$. E. long. $85^{\circ}10'$. —Also, a town of Hindoostan; 30 miles E. of Delhi. —Also, a town of Hindoostan, in Mewat; 25 miles N.E. of Dig.

SHEERS, in *Ship-Building*, are two masts or spars, set across at the upper end of each other, and there lashed together with tackles depending from the intersection; and they are kept upright by guys extending each way from the heads. The heels are spread and lashed, or cleated, to prevent their slipping. By this contrivance very heavy bodies are raised, such as the stem, stern-frame, and the frame-timbers of ships: likewise ships are masted by sheers, or have their masts taken out where there is no sheer-hulk.

SHEET, in the *Manege*. See CAPARISON.

SHEET, in *Sea Language*, a rope fastened to one or both the lower corners of a sail, to extend and retain it in a particular station. When a ship sails with a lateral wind, the lower corner of the main and fore-sail are fastened by a

tack and a sheet; the former being to windward, and the latter to leeward; the tack, however, is entirely difused with a stern wind, whereas the sail is never spread without the assistance of one or both of the sheets. The stay-fails and studding-fails have only one tack, and one sheet each; the stay-sail tacks are always fastened forward, and the sheet drawn aft; but the studding-sail tack draws the under clew of the sail to the extremity of the boom, whereas the sheet is employed to extend the inmost. Falconer. See SHEATS.

SHEET, *To hale home the*. See HOME.

SHEET-Anchor. See ANCHOR.

SHEET-Nails. See NAIL.

SHEET-Stopper. See STOPPER.

SHEETING, a term signifying the flooring of jointed planks, under the lock-gates of a canal, and at the tail of every lock and sluice, &c.

SHEFFIELD, JOHN, in *Biography*, duke of Buckinghamshire, son of the earl of Mulgrave, was born in the year 1649. At the death of his father he succeeded to his title: this was in the year 1658. At an early age he dismissed his governor, but supplying the want by his own industry, he acquired a considerable proficiency in literature. His martial ardour broke out at the age of seventeen, when he engaged in the first Dutch war as a volunteer. The indications which he gave of the love of pleasure, united with literary talents, which had a peculiar value in the reign of Charles II. rendered him a favourite at court, and he materially assisted in the obtaining for Dryden the appointment to the post of laureat. At the commencement of the second Dutch war, he was a volunteer in the fleet commanded by the duke of York, and was present at the battle of Solebay, in which he behaved with so much gallantry, that on his return he was made captain of a second-rate ship of war. In the following year he was appointed colonel of a regiment of foot under general Schomberg. In 1674 he was decorated with the order of the Garter. He was, in 1679, appointed lord-lieutenant of Yorkshire, and governor of Hull, in which year he wrote a piece, entitled "The Character of a Tory, in answer to that of a Trimmer." In this we have an avowal of his political principles, which were those of the party in whose name he wrote, and to which he adhered during life. In 1680 he went out with a force to the relief of Tangier, then invested by the Moors. In this expedition he completely succeeded, and with it ended the military services of lord Mulgrave. On the accession of James II. he was chosen of the privy-council, and made lord-chamberlain of the household. He returned these favours by a zealous attachment to his master, which led him to take a seat in the ecclesiastical commission; but in this he opposed those measures of the priests which brought on the speedy ruin of that infatuated prince. Though inimical to the revolution, yet he voted for the conjunct sovereignty of king William with Mary. In 1694 he was made marquis of Normanby; notwithstanding this, and his admission into the cabinet, with a pension, yet he still had a great dislike to the king. On the accession, however, of queen Anne, his former attachment to the court was revived, and he experienced her favour by an appointment to the privy-seal, and by other honours, which were terminated in 1703, by a nomination to the dukedom of Buckinghamshire. Jealous of the influence of the duke of Marlborough, he resigned the office of privy-seal, and remained out of office several years, during which he built the house in St. James's park, which has, during this reign, been the principal residence of the queen. At the great change of the ministry in 1710, he was again introduced, first as steward of the

household, and then as president of the council. After the death of queen Anne he was an opponent of the court, and employed his time chiefly in literary pursuits, till his death, in 1721.

The duke had been thrice married, and each time to a widow: his last wife was a natural daughter of James II., by whom he had a son that survived him. Following the example of the court of Charles II., he freely indulged in licentious amours; nevertheless, it has been said that he had occasionally serious thoughts of religion, though probably not restricted to any particular party. The following is the epitaph which he composed for himself: "Dubius fed non improbus vixi: incertus morior, fed inturbatus: humanum est nescire et errare. Christum adveneror: Deo confido omnipotenti, benevolentissimo: Ens entium miserere mei." This was inscribed on his magnificent monument in Westminster Abbey, with the exception of the clause respecting Christ, which bishop Atterbury rejected, thinking simple veneration a derogatory expression applied to the second person in the Trinity.

In the capacity of poet, the duke of Buckinghamshire does not rank very high; his compositions are on a variety of topics, of which, however, the chief is "An Essay on Poetry," which, according to Dr. Johnson, contains judicious precepts, which are sometimes new, and often happily expressed, but with many weak lines, and some strange instances of negligence. In his "Essay on Satire," he is supposed to have been assisted by Dryden, who, for some peculiarities in it, had the misfortune to be taken as the real author.

The duke of Buckinghamshire composed two tragedies, entitled "Julius Cæsar," and the "Death of Brutus;" for the latter of which, at his request, Pope wrote two chorusses: of these Warburton says, that they have the usual effect of ill-placed ornaments, they make the meanness of the piece more conspicuous. In the collection of the duke's works are likewise historical memoirs, speeches, essays, &c.

SHEFFIELD, or *Sheaffield*, in *Geography*, a large and populous market and manufacturing town in the south division of the wapentake of Strafford and Tickhill, liberty of Hallamshire, West Riding of Yorkshire, England, is situated at the distance of 36 miles S. from Leeds, and 162 N.N.W. from London. The origin and remote history of this town are totally unknown. In the 13th century it was noted as a staple for articles of iron manufacture. Chaucer, who wrote in the reign of Edward III., mentions the "Sheffield Whittle" in one of his poems. At that period it was likewise distinguished by a strong castle, which stood at the north-east of the town, and is said to have been built during the sovereignty of Henry III. This castle descended from the Lovetofts to the Nevils, lords Furnival, and passed from them to the Talbots, earls of Shrewsbury, and subsequently to the Howards, dukes of Norfolk, in whose family the lordship of the manor is still vested. During the civil wars between Charles I. and his parliament, Sheffield castle sustained a long siege in the cause of royalty, but eventually surrendered upon honourable terms, on the 10th of August, 1644, and was soon afterwards ordered to be demolished, which seems to have been done most effectually, as scarcely a vestige of it can now be discovered.

Though Sheffield, as already said, was considered as a staple for iron manufactures at a very early period, its trade, for several centuries, was comparatively confined and precarious, and consisted almost entirely in the making of sheath-knives, scissors, sickles, and scythes. About the commencement of the 17th century, an ordinary kind of tobacco-box of iron, and Jews' harps, began to be manufactured here;

and in 1625 the master manufacturers were first incorporated by the style of "The Company of Cutlers of Hallamshire." This corporation is governed by a master, elected annually, six searchers, and twenty-four assistants, and is the only body corporate yet existing in Sheffield. It was not, however, till after the year 1750, that this town assumed the rank it now holds in manufacturing opulence. Previously to that period, none of the manufacturers had extended their traffic beyond the limits of Great Britain; but in the same year Mr. Joseph Broadbent opened a direct trade with the continent; and in 1751, the river Don having been rendered navigable to within three miles of the town, that facility was given to exportation, which has since proved so beneficial to its manufacturing interests. Soon afterwards Mr. Thomas Bolfover began to plate brass and copper buttons with silver; and in 1758 the silver plated manufacture was commenced on an extensive scale by Mr. Joseph Hancock, and has subsequently been prosecuted with great advantage by a numerous class of individuals. The opulence and population of the town increased from that time with great rapidity, and soon gave rise to numerous conveniences and improvements, both useful and ornamental. In 1760, the first stage-coach started from Sheffield for London; and in 1762, the theatre and assembly-room were built by subscription. In 1770, the first bank in Sheffield was opened by Mr. Roebuck; and in 1786, the new market-place was formed, about the same time that Messrs. Proctors erected the first steam-engine grinding-wheel. In 1793, hackney coaches were introduced; and in the same year also was laid the foundation of the General Infirmary. These circumstances are mentioned, because they are calculated to display the progressive benefits resulting from successful industry and ingenuity, the contemplation of which can scarcely fail to excite pleasurable emotions in every breast.

To notice particularly the various articles manufactured at Sheffield of late years, would occupy too considerable a space to admit of the attempt. The two great divisions of them are into cutlery and plated goods, each of which branch out into numerous ramifications. The manufacture of the latter is almost entirely confined to the town, and comprehends a great diversity of articles: such as tea-urns, coffee-pots, tankards, cups, candlesticks, and other pieces of table furniture. The cutlery division embraces the making of edge-tools, combs, cases, buttons, fenders, files, anvils, joiners' tools, lancets, forks, hafts, ink-stands, nails, knives of every description, scissors, scythes, sickles, awl-blades, bellows, &c. to which we shall only further add the refining of steel. Many of these manufactures are carried on in the country, as well as in the town, especially in the villages and hamlets of Altercliffe, Bentsgreen, Brightside, Butterthwaite, Carbrooke, Darnal, Dyson-Holmes, Dungworth, Ecclesfield, Greenoside, Grimesthorpe, Hallam, Miln-houses, Newfield-Green, Owlerton, Pittfmoor, Stannington, Shiregreen, Upper-Heeley, Wadsley, Woodseats, &c.; all of which are situated within seven miles of Sheffield. Besides the above manufactures, there are in the town and its vicinity several extensive foundries for iron, brass, and white metal.

Sheffield occupies a fine eminence at the confluence of two rivers, the Sheaf, whence the name of the town is derived, and the Don. In former times the houses were entirely built of stone; but for the last century they have been chiefly composed of brick. There are few towns which surpass it in the regularity of its streets, many of them running in a direct line, and displaying a series of uniform and respectable edifices. Sheffield extends about
a mile

a mile in length, from north to south, and nearly as much in breadth, from east to west. According to the population census of 1811, it contains 7927 houses, and 35,840 inhabitants, being an increase of 4526 persons since 1801, the date of the preceding report, notwithstanding the retardation its manufacturing prosperity has sustained during that eventful period. According to Gosling's plan of the town, made in 1732, there were 32 streets in Sheffield at that time: in 1771 these were increased by 25 new streets; and in 1792, seventeen additional streets had been made.

Sheffield is not particularly distinguished by the superiority of its public buildings, which are rather calculated for purposes of utility than for show. The principal of them are the Town-hall, built in 1700, Cutlers'-hall, the General Infirmary, the assembly-room, and theatre, and four churches belonging to the establishment. Neither the Town-hall nor Cutlers'-hall deserve attention as architectural productions; but the infirmary and theatre are handsome structures. The former, commenced in 1793, stands on the west side of the town; and in respect of situation, plan, medical aid, and comfortable treatment, may vie with almost any similar institution in Great Britain. The latter, which occupies the same building with the assembly-room, stands in Norfolk-street. The four churches are Trinity church, St. Paul's, St. James's, and a chapel belonging to the duke of Norfolk's hospital. Trinity church, anciently called St. Peter's, is the parish church of Sheffield, and appears to have been erected as early as the reign of Henry I. On the south side of the chancel is the Shrewsbury chapel, which contains four monuments to the memory of the earls of Shrewsbury of the family of Talbot; and on the north side is a monument commemorating judge Jessop of Broom-hall, and his lady. At the entrance to the same division of the church are deposited the remains of William Walker, of Darnal, in this parish, who is said to have been the executioner of Charles I. Besides the above churches, Sheffield contains seven meeting-houses for Protestant dissenters, one for Unitarians, two for Methodists, one for Quakers, and a Roman Catholic chapel.

The duke of Norfolk's hospital, mentioned above, stands on the eastern bank of the Sheaf. It was founded and endowed in 1670, by Henry, earl of Norwich, and received a considerable accession of property by Edward, duke of Norfolk, in 1770. The building consists of two quadrangles, each containing eighteen dwellings, for the accommodation of eighteen men, and the same number of women, all of whom receive five shillings a-week, with clothing and coals. Here is also an hospital founded by Mr. Thomas Hollis, a merchant of London, in 1703, for poor cutlers' widows; likewise a free grammar-school, and two charity-schools; one for boys, and another for girls.

The other objects of a public kind which remain to be noticed are, the military barracks, situated at the north-eastern extremity of the town; and the bridges thrown over the Sheaf and the Don. That upon the latter river is called Lady's bridge, from a religious house, which formerly stood near it, and was dedicated to the Virgin Mary. It was built in 1485, but underwent great alterations and improvements in 1762.

Sheffield has two market days, weekly, Tuesday and Saturday; the first for corn, &c. and the second for butchers' meat. There are also fish-markets on Monday and Thursday, and two annual fairs, one on the first Tuesday after Whitfun week, and another on the 28th of November. A new market-place, with extensive and commodious shambles and other conveniences, was formed and finished here Aug. 31, 1786. Sheffield supports a weekly

newspaper, called the "Iris," which is edited by Mr. James Montgomery, the author of "The World before the Flood," and other interesting poems.

The scenery in the vicinity of this town may be characterized as romantic. It is surrounded by lofty hills, commanding fine views over a populous and variegated country. At the distance of about a mile and a half to the eastward, stand the ruins of Sheffield manor-house, the ancient seat of the earls of Shrewsbury, where cardinal Wolfsey was seized with the disease which terminated his life about a week afterwards, at the abbey of Leicester. Wharnccliffe park, the seat of the honourable James Archibald Stuart Wortley, situated on the river Don, six miles to the north-west of Sheffield, is equally remarkable for the elegance of its mansion, and the beauty of the surrounding grounds. In the neighbourhood of Sheffield are some alum mines; and at Wickersley, near the town, is a quarry, which supplies the manufacturers with grind-stones for the finer articles of cutlery. Aikin's Description of the Country round Manchester, 4to. 1795. Magna Britannia, 4to. 1703. Camden's Britannia, fol. edit. 1789. Beauties of England and Wales, vol. xvi. by John Bigland, 8vo. 1812. Gentleman's Magazine, April and September, 1764.

SHEFFIELD, a town of America, in the state of Vermont, and county of Caledonia, containing 455 inhabitants.—Also, a town of the state of Massachusetts, in the county of Berkshire; incorporated in 1733, and containing 2439 inhabitants. It is traversed by Housatonic river, which supplies water for several mills and river-works. South mountain extends along the whole length of the town, on the E. side of the river.

SHEFFIELDIA, in *Botany*, Forst. Gen. t. 9, was so called by Forster in honour of the Rev. Mr. Sheffield, whom he designates as the chief botanist at Oxford. This gentleman was, we believe, one of the companions of the illustrious Banks, in the early part of his studies, and retained to the last a love of the science, though without having materially contributed to its advancement. He was living as a fellow of a college, at rather an advanced age, in 1788. The genus in question is now sunk in *SAMOLUS*; see that article.

SHEFFORD, in *Geography*, a market-town in the parish of Compton, hundred of Clifton, and county of Bedford, England, is situated at the distance of 10 miles S.E. from Bedford, and 41 miles N.N.W. from London. It was formerly a place of much more importance than at present, and had a large weekly market on Friday, which has now become almost nominal. Still, however, it possesses the advantages arising from four annual fairs, held on the 23d of January, Easter Monday, the 19th of May, and the 10th of October. The two first usually afford a large supply of sheep and cows; the third is less important; and the fourth is now only a holiday fair. Shefford is a chapelry, having distinct officers of its own, and maintaining its own poor. Here is a Roman Catholic chapel, endowed with an annual stipend left in trust for that purpose. According to the parliamentary returns of 1811, this town contained 123 houses and 536 inhabitants.

In the parish of Flitton, and at the distance of about four miles from Shefford, is Wrest Park, the seat of baroness Lucas, as representative of the family of the Greys, earls and dukes of Kent. In its present state the house retains little appearance of antiquity, having been at various times altered and modernized. It contains a large collection of portraits, forming nearly a complete series of all the members of the noble family just mentioned, from Henry, earl of Kent, one of the peers who sat on the trial of Mary, queen

queen of Scots, down to the present time. Here are likewise several portraits of the Crew family, and others; among which are sir Randolph Crew, lord chief justice of the court of king's bench; a fine picture of Thomas lord Crew, by sir Peter Lely; Nathaniel lord Crew, bishop of Durham; and the late lord chancellor Hardwicke.

The garden attached to this mansion exhibits a specimen of the old style of arrangement and ornament, modified and improved by the celebrated Brown, who formed the serpentine canal, which nearly surrounds the garden, and is supplied by a spring rising near the house. At the spring-head is a cold bath, over which is a building, designed by sir William Chambers, in imitation of a Roman temple. The late duke of Kent, who was very partial to this residence, adorned the gardens with obelisks, and other buildings, particularly a magnificent banquetting house, which terminates a spacious avenue in front of the house. Lysons's *Magna Britannia*, Bedfordshire, 4to. 1806. *Beauties of England and Wales*, vol. i. by John Britton and E. W. Brayley, 8vo. 1803.

SHEFNAL. See **SHIFFNAL.**

SHEHERON, a town of Persia, in the province of Irak; 15 miles E. of Kermanshaw.

SHEHERVERD, a town of Persia, in the province of Irak; 30 miles S.W. of Sultania.

SHEHOUN, a town of Syria, under the jurisdiction of an independent aga, anciently called "Cappareas;" 18 miles N. of Hamah.

SHEHRBAN, or **SHEREBAN**, a town of the Arabian Irak, on the Diala; 50 miles N. of Bagdad. N. lat. $34^{\circ} 8'$. E. long. $44^{\circ} 5'$.

SHEHRIGHERD, a town of Persia, in the province of Irak; 33 miles W.S.W. of Kom.

SHEHRISTAN, a town of Persia, in Khorassan; 210 miles W. of Herat. N. lat. $35^{\circ} 10'$. E. long. $56^{\circ} 20'$.—Also, a town of Persia, in the province of Chusistan, or Kuzistan; 50 miles N.W. of Schiras.

SHEIB, a lake of Egypt; 48 miles E.N.E. of Cairo.

SHEIDEK, a mountain of Switzerland, in the S.E. part of the canton of Berne; 10 miles S.E. of Interlacken.

SHEIK, or **SCHEIK**, in the *Oriental Customs*, the person who has the care of the mosques in Egypt: his duty is the same as that of the imams at Constantinople. There are more or fewer of these to every mosque, according to its size or revenues. One of these is head over the rest, and answers to a parish-priest with us, and has under him, in large mosques, the readers and people who cry out to go to prayers; but in small mosques the sheik is obliged to do all this himself. In such it is their business to open the mosque, to cry to prayers, and to begin their short devotions at the head of the congregation, who stand rank and file in great order, and make all their motions together. Every Friday the sheik makes an harangue to his congregation. Pococke's *Egypt*, p. 171.

SHEIK-Bellet, the name of an officer in the Oriental nations.

In Egypt the sheik-bellet is the head of a city, and is appointed by the pacha. The business of this officer is to take care that no innovation be made, which may be prejudicial to the Porte, and that they send no orders which may hurt the liberties of the people. But all his authority depends on his credit and interest, not his office: for the government of Egypt is of such a kind, that often the people of the least power by their posts have the greatest influence; and a caia of the janizaries, or Arabs, and sometimes one of their meanest officers, an oda-basha, finds means,

by his parts and abilities, to govern all things. Pococke's *Egypt*, p. 161.

SHEIKHAUT, in *Geography*, a town of Bengal; 8 miles N. of Ilamabad.

SHEIKH-UL-JEBAL, *Dominions of*, or lord of the mountains (commonly called the old man of the mountain) comprised the whole of that elevated tract in the province of Azerbaijan in the Persian empire, which runs parallel with the course of the Kizilozain and the greater part of Ghilan. When destroyed by Holaku, the Houssieines, or Affassins, possessed upwards of 100 strong-holds; but the residence of the prince was generally confined to the castles Roudbar and Allah Ahmout, both of which are situated in the Kohr Caucasian, near Kazween.

SHEIKPOUR, a town of Hindoostan, in Bahar; 28 miles E. of Bahar. N. lat. $25^{\circ} 9'$. E. long. $86^{\circ} 3'$.

SHEIMERS, a town of New Jersey; 34 miles N.W. of Morristown.

SHEK ABADÉ, a town of Egypt, anciently called *Antinoë*; 8 miles N. of Abu Girgê.

SHEK Abdalla, a village of Syria, in the pachalic of Aleppo, where are some springs of water; 20 miles S.E. of Aleppo.

SHEK Abu Ennur, a town of Egypt; 7 miles S. of Benisuef.

SHEK Ammer, a town of Egypt, situated on the Nile; 17 miles N. of Syene.

SHEK Embadé, a town of Egypt, on the right bank of the Nile; 16 miles S.S.E. of Girgê.

SHEK Eredi, or **Haradi**, a town of Egypt, on the E. side of the Nile. Here is the tomb of a Turkish saint, who after his death is said to have been metamorphosed into a serpent, which never dies, and is consulted as a physician; 8 miles N.N.E. of Achmim.

SHEK il Etman, a town of Egypt, on the Nile; 7 miles S.S.W. of Cairo.

SHEK Fadlé, a town of Egypt, on the right bank of the Nile; 10 miles S. of Abu Girgê.

SHEK Zeineddin, a town of Egypt, on the left bank of the Nile; 3 miles N. of Tahta.

SHEKEL, **SHEKLE**, *Sheckle*, *Siclus*, an ancient Hebrew silver coin, which was originally a didrachm, but, after the Maccabees, about the value of the Greek tetradrachm, or four Attic drachmas, or four Roman denarii, allowing the drachma and denarius to be of the same value; and, according to Mr. Raper's valuation of the drachma at $9^d.286$, equal to $37^d.144$. See **DENARIUS** and **DRACHM**.

In the Bible, the shekel is sometimes also rendered *solidus*, and sometimes *stater*.

The Jewish doctors are in great doubt about the weight of the shekel; and it is only by conjecture, and by the weight of the modern shekel, that the ancient one is judged equal to four Attic drachmas.

Father Souciet has described several of these shekels in his Dissertation on the Hebrew Medals. By the way he observes, that the third and fourth parts of a shekel, described by Waferus, de Ant. Numb. Heb. are counterfeits of that author.

The Hebrew shekel, according to F. Merfenne, weighs 268 grains, and is composed of 20 oboli, each obolus weighing 16 grains of wheat. This, he says, is the just weight, as he found by weighing one in the French king's cabinet. He adds, that such as come short of this weight have been filed or clipped. Bishop Cumberland tells us, he has weighed several, and always found them near the weight of a Roman femuncia, or half ounce. Mr. Raper infers from various considerations (see **DRACHM**), that the mean

mean didrachm, of 133 troy grains, must be very near its just weight, and its half, or $66\frac{1}{2}$ grains, that of the Attic drachm. The weight of the shekel would therefore be $66\frac{1}{2} \times 4 = 266$ troy grains.

Some are of opinion, that the Hebrews had two kinds of shekels, the *common*, or *profane* shekel, called *didrachma*; and the shekel of the *sanctuary*; which last they will have to be double the former. By this expedient they think we may get clear of some difficulties occurring in Scripture, where things are mentioned as of incredible weight; particularly that passage where it is said, that every time Abalom cut off his hair, the weight of which used to incommode him, he cut off the weight of two hundred shekels.

But Villalpandus will not hear of such a distinction; nor do bishop Cumberland, M. Morin, Greaves, &c. take the opinion to have any foundation. The *profane* shekel, or shekel of four drachmas, they agree, was the same with the *sacred* shekel; and it was only called by this last name, because the standard of it was kept in the sanctuary by the priests.

Greaves apprehends, that the *τριχοντα αργυρια*, or 30 pieces of silver, which were given to Judas, as the reward of his treason, were 30 shekels. Some modern writers, he says, imagine they were 30 denarii, and others, that they were *triginta librae*, or *triginta talenta*. Greaves's Works, vol. i. p. 257, note n.

It is maintained by several, that the Jews had also a *gold* shekel, *scelus aureus*, of the same weight with the silver one; and valued at 1*l.* 16*s.* 6*d.* sterling.

The shekel is supposed to have been first struck in the Desert, on the footing of 100 to the Attic mina, weighing 160 grains of wheat, and current for 10 geratis, or oboli; but that afterwards they were struck of double that weight.

Some will have the shekel to be the oldest piece of money in the world, as being in use in Abraham's time; but this was not coined, or stamped, nor had any other value besides its intrinsic worth.

Xenophon mentions shekels as current in Arabia; and Du Cange speaks of others struck and current in England.

Pinkerton, in his Essay on Medals, (vol. i. p. 291.) suggests, that the Hebrew shekel, and also the brass coins, with Samaritan characters, were not mof of them later than the Christian era, and generally the fabrications of modern Jews. At any rate, the same impression of a sprig on one side, and a vase upon the other, runs through all the coins of that barbarous nation; and the admission of but one of them is rightly esteemed to be almost a disgrace to a cabinet.

SHEKIDJEK, in *Geography*, a town of Grand Bucharia; 60 miles N.W. of Saganian.

SHEKOABAD, a town of Hindoostan, in Dooab; 60 miles W. of Canoge. N. lat. $27^{\circ} 9'$. E. long. $79^{\circ} 2'$.

SHELAH, a town of Asiatic Turkey, in Natolia, near the Black sea; 12 miles N. of Ismid.

SHELAN, a town of Persia, in the province of Farsistan, near the Persian gulf; 75 miles S.S.W. of Jarom.

SHELBURN, a town of America, in the province of Vermont, and county of Chittenden, on the E. side of lake Champlain, containing 987 inhabitants.

SHELBURN Bay, a bay on the N. coast of New Holland, between Oxfordnefs and Cape Grenville.

SHELBURNE, sometimes called *Port Rosfeway*, a seaport town of Nova Scotia, at the head of a bay, in the S.W. part of the province. At the conclusion of the American war, this place was made the seat of royalty, and it was designed to erect many buildings here, and in 1783 it contained above 600 families: but being neglected and unable to defend themselves, many of them afterwards left

the town; 90 miles W. of Halifax. N. lat. $43^{\circ} 50'$. W. long. $63^{\circ} 15'$.

SHELBURNE, a town of America, in the province of Massachusetts and county of Hampshire, containing 961 inhabitants; 98 miles W. of Boston.—Also, a town of New Hampshire, in the county of Cors, incorporated in 1769, and containing 176 inhabitants.

SHELBY. See SHEBBY.

SHELD AFLE, a name used in several parts of the kingdom for the chaffinch.

SHELDON, GILBERT, in *Biography*, archbishop of Canterbury, was born in 1598, at Stanton, in Staffordshire. His father was a menial servant of Gilbert, earl of Shrewsbury, though descended from an ancient family in Staffordshire. The subject of this article took his name from the earl, who was his god-father. Having laid the foundation of a good education, he was entered of Trinity college, Oxford, in 1613, and after taking the usual degrees was elected fellow of All Souls' college, in 1622. When he had taken orders he became chaplain to lord keeper Coventry, who made use of his services on various important occasions. As a reward for these services he presented him with a prebend of Gloucester, and recommended him to his majesty, as one extremely well versed in political affairs. When he had taken his doctor's degree, in 1634, he was elected warden of All Souls' college. He was also chaplain in ordinary to the king, and clerk of the college, and was in the road to farther preferment when the civil wars broke out, and checked his career. He was a zealous adherent to the royal cause, attended the king on various occasions, and rendered himself obnoxious to the parliament: on which account he was ejected from his wardenship, and imprisoned for six months. On his liberation, he retired to his friends in the country, and from his own purse, and the contributions of others, he sent frequent supplies to Charles II. during his exile. On the restoration he received ample rewards for his sufferings and steady loyalty, being restored to his offices, and promoted to the see of London.

The conference between the episcopal and presbyterian divines in 1661, was held at the Savoy, in bishop Sheldon's lodgings. On this occasion he is accused by the opposite party of want of fairness, and he rejected the proposal of an amicable discussion, and insisted that the Presbyterians should first bring in writing all their objections against the liturgy, and all the additions which they proposed. He did not appear often at the conference, and never entered into disputation, yet he was known to have had the principal share in the determination. To conciliate was not his object; he was resolved to carry his point by power: when it was debated in council in August 1662, whether the act of Uniformity should be punctually executed that month, or be suspended for a time, bishop Sheldon pleaded against the suspension, and carried the council with him. "If," says his biographer, "in these and other instances he appears too much the political churchman, in public spirit and munificence he sustained, after an exemplary manner, the character of a great prelate. He expended large sums upon the episcopal houses of the see of London, and being in 1665 translated to that of Canterbury, he rebuilt the library at Lambeth, and made many additions to its contents."

On the removal of lord Clarendon from the chancellorship of the university of Oxford, he was chosen to succeed him in December 1667, and he immortalized his name in that university by the erection, at his sole expence, of the celebrated theatre at Oxford. Of this act bishop Lowth says, "Munus dignum auctore—quod cum intueor et circumspicio video mihi in ipsa Roma, vel in mediis Athenis, antiquis

tiquis illis, et cum maxime florentibus versari." This edifice was opened in July 1679, and almost immediately after the archbishop resigned the chancellorship, and retired from all public business: during the latter part of his life he chiefly resided at Croydon. He died at Lambeth, on the 9th of November, 1677, in the 80th year of his age.

This prelate appears to have been more attached to the duties of morality, than to the profession of any particular doctrines of religion: to young men of rank his advice was always this: "Let it be your principal aim to become honest men, and afterwards be as devout and religious as you will. No piety will be of advantage to yourselves or others, unless you are honest and moral men." Burnet says that "he seemed not to have a deep sense of religion, if any at all, and spoke of it commonly as an engine of government, and a matter of policy;" but he allows that he was a very generous and charitable man. From his own books it appears, that from the time of his becoming bishop of London till his death, he expended for public and charitable uses 66,000*l*. He published a sermon at the thanksgiving for the king's restoration. He was intimate with Chillingworth, and found means to overcome his scruples respecting subscription to the articles of the church of England.

SHELDON, formerly *Hungerford*, in *Geography*, a post-town of America, in the state of Vermont, and county of Franklin, containing 883 inhabitants; 14 miles E. of lake Champlain.

SHELE, a river of England, in the county of Northumberland, which runs into the Tyne, near its head.

SHELF, a term used by the miners in many parts of England, to express a distinction of the inner structure of the earth, so little known to philosophers, that they have no word to express it by. These workmen sometimes also express it by the term *fast ground*, or *fast country*. What they mean by this is, that part of the earth, which they find lying even, and in an orderly manner, and evidently having attained its primitive form and situation, unmoved by the waters of the general deluge, while the circumjacent, and upper strata, have plainly been removed, and tossed about.

It is evident to reason, that there must have been a very violent concussion of the superficial part of the earth, in the time of its being covered by the waters of the deluge; and experience as much evinces this as reason. Before this concussion it appears probable, that the uppermost surface of mineral veins, or loads, did in most places lie even with the then surface of the earth. The remains of this surface, found at different depths in digging, the miners express by the word *shelf*.

In this concussion of the waters covering the whole earth, its natural surface, together with the uppermost surface of those mineral veins, were then in many places loosened, and torn off; and the earth, and with it the mineral nodules, called *shoad-stones*, were carried down with the descending waters from hills into the adjacent vallies, and sometimes into the streams of rivers, by which they were washed to yet greater distances from their original place. On this depends the method of training mines. Phil. Trans. N° 69. See TRAINING.

SHELFY, or SLATY Soil, in *Agriculture*, that sort which is chiefly formed of a kind of thin laminated, brittle, slaty material, or which has it much mixed and incorporated with its other earthy parts. It is a prevailing sort of land in some districts; this sort of rotten slaty matter being largely intermixed with the light loamy mould that constitutes the earthy parts of it.

Where the subsoil or substratum is a schistus, or soft

slate, as is the case in some places in Cornwall, there is great difference, in point of fertility, in the land, according as the disposition of the laminæ is more flat, or the contrary; as when flat, the surface is more retentive of the manure which is employed; but when on the edge, what is called a greedy or hungry sort of land is formed, that permits the manure to be washed down through it in too ready a manner, and be lost. See SOIL.

SHELL, TESTA, in *Natural History*, a hard calcareous crust, serving to cover and inclose a kind of animal, hence called *testaceous*. See CONCHOLOGY and TESTACEOLOGY.

SHELLS, *Collecting and cleaning of*. See CONCHOLOGY.

SHELLS, *Figures and Colours, &c. of*. It is observed, that river-shells have not so agreeable or diversified a colour as the land and sea-shells; but the variety in the figure, colours, and other characters of sea-shells, is almost infinite. The number of distinct species we find in the cabinets of the curious is very great; and doubtless the deep bottoms of the sea, and the yet unsearched shores, contain multitudes more, yet unknown to us. Even the same species differ in some degree in almost every individual, so that it is rare to find any two shells which are alike in all respects. Bonan. Recreat. Ment. et Ocul. p. 49.

This wonderful variety, however, is not all the produce of one sea, or one country; the different parts of the world afford us their different beauties. Bonani observes, that the most beautiful shells we are acquainted with come from the East Indies, and from the Red sea. This is in some degree countenanced by what is found to this day; from the general observations of the curious, it seems that the sun, by the great heat that it gives to the countries near the line, exalts the colours of the shells produced there, and gives them a lustre and brilliancy, that those of colder climates always want; and it may be, that the waters of those vast seas, which are not subject to be weakened by fresh rivers, give a nourishment to the fish, that may add to the brilliancy of their shells.

The shores of Asia furnish us with the pearl oysters and scallops in great perfection. About Amboyna are found the most beautiful specimens of the cabbage-shell, the arroi, the ducal mantle, and the coral oysters, or echinated oysters. Here also are found a great variety of extremely beautiful muscles, tellinæ, and volutæ; some fine buccinums, and the shell called the *Ethiopian crown*, in its greatest perfection.

The dolia, the murices, and the cassandra, are also found on these coasts in great beauty. Many elegant snails and screw-shells are also brought from thence; and finally the serapion and spider-shells. Hist. Nat. Eclairc. p. 168.

The Maldives, and Philippine islands, Bengal, and the coast of Malabar, abound with the most elegant of all the species of snails, and furnish many other kinds of shells in great abundance and perfection.

China abounds in the finest species of porcelain shells, and has also a great variety of beautiful snails.

Japan furnishes us with all the thicker and larger bivalves; and the isle of Cyprus is famous above all other parts of the world, for the beauty and variety of the patella, or limpet, found there.

America affords many very elegant shells, but neither in so great abundance nor beauty as the shores of Asia.

Panama is famous for the cylinders or rhombi, and we have beside, from the same place, some good porcelains, and a very fine species of dolium, or *concha globosa*, called from this place the *Panama purple shell*. One of the most beautiful of the cylinders is also known among our naturalists under the name of the *Panama shell*.

About

SHELLS.

About Brasil, and in the gulf of Mexico, there are found murices and dolia of extreme beauty, and also a great variety of porcelains, purpuræ, pectens, neritæ, bucardiæ, or heart-shells, and elegant limpets.

The isle of Cayenne affords one of the most beautiful of the buccinum kind, and the Midas ear is found principally about this place.

Jamaica, and the island of Barbadoes, have their shores covered with porcelains, chamæ, and buccina; and at St. Domingo there are found almost all the same species of shells that we have from the East Indies, though they are less beautiful, and the colours more pale and dead. The pearl oyster is found also on this coast, but smaller than in the Persian gulf. At Martinico there are found in general the same shells as at St. Domingo, but yet less beautiful.

About Canada are found the violet chamæ, and the lakes of that country abound with muscles of very elegant pale blue and pale red colours; some species of these are remarkably light and thin; others are very thick and heavy.

The Great Bank of Newfoundland is very barren in shells: the principal kinds found there are muscles of several species, some of which are of considerable beauty.

About Carthage there are many mother-of-pearl shells, but they are not of so brilliant colours as those of the Persian gulf.

The island of Magellan, at the southern point of America, furnishes us with a very remarkable species of muscle, called by its name; and several very elegant species of limpets are found there, particularly the pyramidal.

In Africa, on the coast of Guinea, there is a prodigious quantity of that small species of porcelain, which is used there as money; and there is another species of porcelain on the same coast, which is all over white: the women make bracelets of these, and the people of the Levant adorn their hair with them.

The coast of Zanguebar is very rich in shells: we find there a vast variety of the large porcelains, many of them of great beauty; and the *nux maris*, or sea-nut, is very frequent there. Beside these, and many other shells, there are found on this coast all the species of nautili, many of which are very beautiful.

The Canary Isles are found to abound with a vast variety of the murices, and some other good shells; and we have from Madeira great variety of the echini, or sea-eggs, different from those of the European seas. Several species of muscles are also common there, and the *auris marina* is nowhere more abundant.

The Red sea is beyond all other parts of the world abundant in shells, so that scarcely any kind is wanting there; but those we principally have from thence are the purpuræ, porcelains, and echini marini.

The Mediterranean and Northern ocean contain a great variety of shells, and many of very remarkable elegance and beauty: they are upon the whole, however, greatly inferior to those of the East Indies. The Mediterranean abounds much more in shells than the ocean.

The gulf of Tarentum affords great variety of purpuræ, of porcelains, nautili, and elegant oysters; the coasts of Naples and Sardinia afford also the same, and with them a vast number of the solens of all the known species.

The island of Sicily is famous for a very elegant kind of oyster, which is white all over; pinnæ marinæ and porcelains are also found in great plenty there, with tellinæ and chamæ of many species, and a great variety of other beautiful shells.

Corfica is famous beyond all other places for vast quantities of the pinnæ marinæ, and many other very beautiful shells are found there. Lister, Hist. Conchyl.

About Syracuse are found the gondola shell, the alated murex, and a great variety of elegant snails, with some of the dolia and neritæ.

The Adriatic sea, or gulf of Venice, is less furnished with shells than almost any of the seas thereabout. Muscles and oysters of several species are, however, found there, and some of the cordiformes or heart-shells; there are also some tellinæ. About Ancona there are found vast numbers of the pholades buried in stone, and the *auris marina* are particularly frequent about Puzzoli. Bonani. Recreat. Ment. et Ocul.

The ports of Marseilles, Toulon, and Antibes, are full of pinnæ marinæ, muscles, tellinæ, and chamæ. The coasts of Bretagne afford great numbers of the conchæ anatifera and poulepieds; they are found on old rotten boards, on sea substances, and among clusters of sponges. The other ports of France, as Rochelle, Dunkirk, Brest, St. Maloes, and others, furnish oysters, excellent for the table, but of the common kind, and of no beauty in their shells; great numbers of muscles are also found there; and the common tellinæ, the onion-peel oysters, the solens, and conchæ anatifera, are also frequent there. At Granville, in Lower Normandy, there are found very beautiful pectens, and some of the cordiformes, or heart-shells. Our own English coasts are not the least fruitful in shells, though they do not produce such elegantly painted ones as the Indies.

About Plymouth are found oysters, muscles, and solens, in great abundance; and there, and on most of our other shores, are numbers of the *auris marina* and dentalia, with pectens, which are very excellent food; and many elegant species of the chamæ and tellinæ are fished up in the sea about Scarborough, and other places.

Ireland affords us great numbers of muscles, and some very elegant scallop shells in great abundance, and the pholades are frequent on most of our shores. We have also great variety of the buccina and cochleæ, some volutæ; and on the Guernsey coast a peculiarly beautiful snail, called thence the *Guernsey-snail*.

The coasts of Spain and Portugal afford much the same species of shells with the East Indies, but they are of much fainter colours, and greatly inferior in beauty. Hist. Nat. Eclairc. p. 172.

There are, according to Tavernier and others, some rivers in Bavaria, in which there are found pearls of a fine water. About Cadiz there are found very large pinnæ marinæ, and some fine buccina. The isles of Majorca and Minorca afford a great variety of extremely elegant shells. The pinnæ marinæ are also very numerous there, and their silk is wrought into gloves, stockings, and other things. The Baltic affords a great many beautiful species, but particularly an orange-coloured pecten, or scallop shell, which is not found in any other part of the world.

The fresh-water shells are found much more frequently, and in much greater plenty, than the sea kinds; there is scarcely a pond, a ditch, or a river of fresh water, in any part of the world, in which there are not found vast numbers of these shells with the fish living in them. All these shells are small, and they are of very little beauty, being usually of a plain greyish or brownish colour. Our ditches afford us chamæ, buccina, neritæ, and some patellæ; but the Nile, and some other rivers, furnished the ancients with a species of tellina, which was large and eatable, and so much superior to the common sea tellina in flavour, that it is commonly known by the name of *tellina regia*, the royal tellina.

3 P

SHELLS.

We have a small species of *buccinum* common in our fresh waters, which is very elegant, and always has its operculum in the manner of the larger *buccina*; a small kind of muscle is also very common, which is so extremely thin and tender, that it can hardly be handled without breaking to pieces.

The large fresh-water muscle, commonly called in England the *horse muscle*, is too well known to need a description, and the size of this gives it a difference from all other fresh-water shells.

SHELLS, Polishing of. (See CONCHOLOGY.) This is an art of no long standing in the world, in its present perfection; and as the love of sea-shells is become so common among us, it may not be disagreeable to the reader to find some instructions in executing so pleasing a method of adding to their natural beauty, the rules for which are at present so little known, though the effect of them be so much esteemed.

Among the immense variety of shells which we are acquainted with, some are taken out of the sea, or found on its shores in all their perfection and beauty; their colours being all spread by nature upon the surface, and their natural polish superior to any thing that art could give. Where nature is in herself thus perfect, it were madness to attempt to add any thing to her charms; but in others, where the beauties are latent and covered with a coarser outer skin, art is to be called in, and the outer veil being taken off, all the internal beauties appear.

Among the shells which are found naturally polished are the porcelains, or cowries, the cassanders, the dolia, or conchæ globosæ or tuns, some *buccina*, the volutes, and the cylinders, or olives, or, as they are generally though improperly called, the rhombi; excepting only two or three, as the tiara, the plume, and the butter-tub rhombus; where there is an unpromising film on the surface, hiding a very great share of beauty within. Though the generality of the shells of these genera are taken out of the sea in all their beauty, and in their utmost natural polish, there are several other genera, in which all, or most of the species, are taken up naturally rough and foul, and covered with an epidermis, or coarse outer skin, which is in many rough and downy, or hairy. The tellinæ, the muscles, the cochleæ, and many others, are of this kind. The more nice collectors, as naturalists, insist upon having all their shells in their native and genuine appearance, as they are found when living at sea; but the ladies who make collections hate the disagreeable outides, and will have all such polished. It would be very advisable, however, for both kinds of collectors to have the same shells in different specimens, both rough and polished; the naturalist would, by this means, besides knowing the outside of the shell, be better acquainted with its internal characters than he otherwise could be, and the lady would have a pleasure in comparing the beauties of the shell, in its wrought state, to its coarse appearance as nature gives it. How many elegancies in this part of the creation must be wholly lost to us, if it were not for the assistance of an art of this kind! Many shells in their native state are like rough diamonds, and we can form no just idea of their beauties till they have been polished and wrought into form.

Though the art of polishing shells is a very valuable one, yet it is very dangerous to the shells; for without the utmost care, the means used to polish and beautify a shell often wholly destroy it. When a shell is to be polished, the first thing to be examined is whether it have naturally a smooth surface, or be covered with tubercles or prominences.

A shell which has a smooth surface, and a natural dull

polish, need only be rubbed with the hand, or with a piece of chamoy leather, with some tripoli, or fine rotten stone, and will become of a perfectly bright and fine polish. Emery is not to be used on this occasion, because it wears away too much of the shell. This operation requires the hand of an experienced person, that knows how superficial the work must be, and where he is to stop; for in many of these shells the lines are only on the surface, and the wearing away ever so little of the shell defaces them. A shell that is rough, foul, and crusty, or covered with a tartareous coat, must be left a whole day steeping in hot water; when it has imbibed a large quantity of this, it is to be rubbed with rough emery on a stick, or with the blade of a knife, in order to get off the coat. After this it may be dipped in diluted aqua fortis, spirit of salt, or any other acid; and after remaining a few moments in it, be again plunged into common water. This will greatly add to the speed of the work. After this it is to be well rubbed with linen cloths impregnated with common soap; and when by these several means it is made perfectly clean, the polishing is to be finished with fine emery and a hair-brush. If after this the shell when dry appears not to have so good a polish as was desired, it must be rubbed over with a solution of gum arabic; and this will add greatly to its gloss, without doing it any sort of injury. The gum water must not be too thick, and then it gives no sensible coat, only heightening the colours. The white of an egg answers this purpose also very well; but it is subject to turn yellow. If the shell has an epidermis, which will by no means admit the polishing of it, it is to be dipped several times in diluted aqua fortis, that this may be eaten off; and then the shell is to be polished in the usual way with putty, fine emery, or tripoli, on the hair of a fine brush. When it is only a pellicle that hides the colours, the shells must be steeped in hot water, and after that the skin worked off by degrees with an old file. This is the case with several of the cylinders, which have not the natural polish of the rest.

When a shell is covered with a thick and fatty epidermis, as is the case with several of the muscles and tellinæ; in this case aqua fortis will do no service, as it will not touch the skin; then a rough brush and coarse emery are to be used; and if this does not succeed, seal-skin, or, as the workmen call it, *fish-skin* and *pumice-stone*, are to be employed.

When a shell has a thick crust, which will not give way to any of these means, the only way left is to plunge it several times into strong aqua fortis, till the stubborn crust is wholly eroded. The limpets, *auris marina*, the helmet-shells, and several other species of this kind, must have this sort of management; but as the design is to shew the hidden beauties under the crust, and not to destroy the natural beauty and polish of the inside of the shell, the method of using the aqua fortis must be this; a long piece of wax must be provided, and one end of it made perfectly to cover the whole mouth of the shell; the other end will then serve as a handle, and the mouth being stopp'd by the wax, the liquor cannot get in to the inside to spoil it; then there must be placed on a table a vessel full of aqua fortis, and another full of common water.

The shell is to be plunged into the aqua fortis; and after remaining a few minutes in it, is to be taken out, and plunged into the common water. The progress the aqua fortis makes in eroding the surface is thus to be carefully observed every time it is taken out; the point of the shell, and any other tender parts, are to be covered with wax, to prevent the aqua fortis from eating them away; and if there be any worm-holes, they also must be stopp'd up with wax, otherwise

SHELLS.

wife the aqua fortis would soon eat through in those places. When the repeated dippings into the aqua fortis shew that the coat is sufficiently eaten away, then the shell is to be wrought carefully with fine emery and a brush; and when it is polished as high as can be by this means, it must be wiped clean, and rubbed over with gum-water, or the white of an egg. In this sort of work the operator must always have the caution to wear gloves, otherwise the least touch of the aqua fortis will burn the fingers, and turn them yellow; and often, if it be not regarded, will eat off the skin and the nails.

These are the methods to be used with shells, which require but a moderate quantity of the surface to be taken off; but there are others which require to have a larger quantity taken off, and to be uncovered deeper; this is called entirely scaling a shell. This is done by means of an horizontal wheel of lead or tin, impregnated with rough emery; and the shell is wrought down in the same manner in which stones are wrought by the lapidary. Nothing is more difficult, however, than the performing this work with nicety; very often shells are cut down too far by it, and wholly spoiled; and to avoid this, a coarse vein must be often left standing in some place, and taken down afterwards with the file, when the cutting it down at the wheel would have spoiled the adjacent parts.

After the shell is thus cut down to a proper degree, it is to be polished with fine emery, tripoli, or rotten stone, with a wooden wheel turned by the same machine as the leaden one, or by the common method of working with the hand with the same ingredients, when a shell is full of tubercles, or protuberances, which must be preserved. It is then impossible to use the wheel; and if the common way of dipping into aqua fortis be attempted, the tubercles, being harder than the rest of the shell, will be eat through before the rest is sufficiently scaled, and the shell will be spoiled; in this case industry and patience are the only means of effecting a polish. A camel's-hair pencil must be dipped in aqua fortis, and with this the intermediate parts of the shell must be wetted, leaving the protuberances dry; this is to be often repeated, and after a few moments the shell is always to be plunged into water to stop the erosion of the acid, which would otherwise eat too deep, and destroy the beauty of the shell. When this has sufficiently taken off the foulness of the shell, it is to be polished with emery of the finest kind, or with tripoli, by means of a small stick, or the common polishing stone of the goldsmiths may be used.

This is a very tedious and troublesome thing, especially when the echinated oysters and murices, and some other such shells, are to be wrought; and what is worst of all is, that when all this labour has been employed, the business is not well done; for there still remain several places which could not be reached by any instrument; so that the shell must necessarily be rubbed over with gum-water, or the white of an egg afterwards, in order to bring out the colours, and give a gloss: in some cases it is even necessary to give a coat of varnish.

These are the means used by artists to brighten the colours, and add to the beauty of shells; and the changes produced by polishing in this manner are so great, that the shell is often not to be known afterwards for the same it was; and hence we hear of new shells in the cabinets of collectors, which have no real existence as separate species, but are the polished appearance of others well known. To caution the reader against errors of this kind, it may be proper to add the most remarkable species thus usually altered.

The onyx-shell, or volute, called by us the purple or

violet-tip, which in its natural state is of a simple pale brown, when it is wrought slightly, or polished with just the superficies taken off, is of a fine bright yellow; and when it is eat away deeper, it appears of a fine milk-white, with the lower part blueish: it is in this state that it is called the onyx-shell; and it is preserved in many cabinets in its rough state, and in its yellow appearance as different species of shells.

The violet-shell, so common among the curious, is a species of porcelain, or common cowry, which does not appear in that elegance till it has been polished; and the common auris marina shews itself in two or three different forms, as it is more or less deeply wrought. In its rough state it is dusky and coarse, of a pale brown on the outside, and pearly within: when it is eaten down a little way below the surface, it shews variegations of black and green; and when still farther eroded, it appears of a fine pearly hue within and without.

The nautilus, when it is polished down, appears all over of a fine pearly colour; but when it is eaten away but to a small depth, it appears of a fine yellowish colour, with dusky hairs. The burgau, when entirely cleared of its coat, is of the most beautiful pearl-colour; but when only slightly eroded, it appears of a variegated mixture of green and red: whence it has been called the parroquet-shell. The common helmet-shell, when wrought, is of the colour of the finest agate; and the muscles, in general, though very plain shells, in their common appearance, become very beautiful when polished, and shew large veins of the most elegant colours. The Persian shell, in its natural state, is all over white, and covered with tubercles; but when it has been ground down on a wheel, and polished, it appears of a grey colour, with spots and veins of a very bright and highly polished white. The limpets, in general, become very different when polished, most of them shewing very elegant colours; among these the tortoise-shell limpet is the principal; it does not appear at all of that colour or transparency, till it has been wrought.

That elegant species of shell called the junquil-chama, which has deceived so many judges of these things into an opinion of its being a new species, is only a white chama, with a reticulated surface; but when this is polished, it loses at once its reticular work and its colour, and becomes perfectly smooth, and of a fine bright yellow; and the violet-coloured chama of New England, when worked down and polished, is of a fine milk-white, with a great number of blue veins, disposed like the variegations in agates.

The asses ear-shell, when polished, after working it down with the file, becomes extremely glossy, and obtains a fine-rose-colour all about the mouth. These are some of the most frequent among an endless variety of changes wrought on shells by polishing; and we find there are many of the very greatest beauties of this part of the creation which must have been lost, but for this method of searching deep in the substance of the shell for them.

The Dutch are very fond of shells, and are very nice in their manner of working them: they are under no restraint, however, in their works, but use the most violent methods, so as often to destroy all the beauty of the shell. They file them down on all sides, and often take them to the wheel, when it must destroy the very characters of the species. Nor do they stop at this, but, determined to have beauty at any rate, they are for improving upon nature, and frequently add some lines and colours with a pencil, afterwards covering them with a fine coat of varnish; so that they seem the natural lineations of the shell. The Dutch cabinets are by

SHELLS.

this means made very beautiful, but they are by no means to be regarded as instructors in natural history. There are some artificers of this nation who have a way of covering shells all over with a different tinge from that which nature gives them; and the curious are often deceived by these tricks into the purchasing of them as new species.

There is another kind of work bestowed on certain species of shells, particularly the nautilus; this is the engraving on it lines and circles, and figures of stars, and other things: this is too obvious a work of art to suffer any one to suppose it natural. Bonani has figured several of these wrought shells at the end of his work; but it is miserably throwing away labour to do them: the shells are spoiled as objects of natural history by it, and the engraving is seldom worth any thing. They are principally done in the East Indies.

Shells are subject to several imperfections: some of these are natural, and others accidental; the natural ones are the effect of age, or sickness in the fish. The greatest mischief happens to shells by the fish dying in them. The curious in these things pretend to be always able to distinguish a shell taken up with the fish alive, from one found on the shores: they call the first a living, the second a dead shell, and say that the colours are always much the faintest in the dead shells. When the shells have lain long dead on the shores, they are subject to many injuries, of which the being eaten by sea-worms is not the least: age renders the finest shells livid or dead in their colours.

The finest shells are those which are fished up at sea, not found on the shores. The other natural defects of shells are their having morbid cavities, or protuberances, in parts where there should be none. When the shell is valuable, these faults may be hid, and much added to the beauty of the specimen, without at all injuring it as an object of natural history, which should always be the great end of collecting these things. The cavities may be filled up with mastic, dissolved in spirit of wine, or with isinglass: these substances must be either coloured to the tinge of the shell, or else a pencil dipped in water-colours must finish them up to the resemblance of the rest, and then the whole shell being rubbed over with gum-water, or with the white of an egg, scarcely any eye can perceive the artifice: the same substances may also be used to repair the battered edge of a shell, provided the pieces chipped off be not too large. And when the excrescences of a shell are faulty, they are to be taken down with a fine file. If the lip of a shell be so battered, that it will not admit of repairing by any cement, the whole must be filed down to an evenness, or ground on the wheel.

SHELLS, Fossil. See CONCHOLOGY and PETRIFICATIONS.

Shells are frequently found under ground, in places far remote from the sea, in mines, and even on the tops of mountains; but how they should come thither is a thing that naturalists are greatly divided about. The most usual and easy opinion is, that those parts have been formerly sea, or, at least, have been overflowed thereby; and many even go back as far as the grand deluge for this. Others take these to be the natural places of their birth or formation, some of them being found little other than crude clay, others of the same texture with the rock to which they grow, though others seem of as absolute a shelly substance as any in the sea. In effect, they say, these may be only so many different gradations of nature, which can as well produce shells in mines as in the sea, there being no want of saline or earthy particles for the purpose; nor is there any great difference between some sorts of spars and sea-shells.

Dr. Lister judges, that the shells found in stone quarries

were never any part of an animal, and gives this reason for it, that quarries of different stone yield quite different species of shells; different not only from one another, but from any thing in nature besides, which either sea or land does yield. This opinion has been since proved erroneous, and all these bodies to have been really once parts of living animals. See FOSSILS, *Adventitious*, *MARINE Remains*, and *Formed STONES*.

Of these shells, some are found remaining almost entirely in their native state, but others are variously altered, by being impregnated with particles of stone, and of other fossils; in the place of others there is found mere stone or spar, or other native mineral body, expressing all their lineaments in the greatest nicety, as having been formed wholly from them, the shell having been first deposited in some solid matrix, and thence dissolved by very slow degrees, and this matter left in its place, on the cavities of stone and other solid substances, out of which shells had been dissolved and washed away, being afterwards filled up less slowly with these different substances, whether spar or whatever else: these substances, so filling the cavities, can necessarily be of no other form than that of the shell, to the absence of which the cavity was owing, though all the nicer lineaments may not be so exactly expressed. Beside these, we have also in many places masses of stone formed within various shells; and these having been received into the cavities of the shells, while they were perfectly fluid, and having therefore nicely filled all their cavities, must retain the perfect figures of the internal part of the shell, when the shell itself should be worn away, or perished from their outside. The various species we find of these are in many genera as numerous as the known recent ones; and as we have in our own island not only the shells of our own shores, but those of many other very distant ones, so we have also many species, and those in great numbers, which are in their recent state, the inhabitants of other yet unknown or unsearched seas and shores.

The cockles, muscles, oysters, and the other common bivalves of our own seas, are very abundant; but we have also an amazing number of the nautilus kind, particularly of the nautilus græcorum, which though a shell not found living in our own, or any neighbouring seas, yet is found buried in all our clay-pits about London and elsewhere; and the most frequent of all fossil shells in some of our counties, are the conchæ anomia, which yet we know not of in any part of the world in their recent state. Of this sort also are the cornua ammonis and the gryphitæ, with several of the echinitæ and others.

The exact similitude of the known shells, recent and fossil, in their several kinds, will by no means suffer us to believe, that these, though not yet known to us in their living state, are, as some have idly thought, a sort of lusus naturæ.

It is certain, that of the many known shores, very few, not even those of our own island, have been yet carefully searched for the shell-fish that inhabit them; and as we see in the nautilus græcorum an instance of shells being brought from very distant parts of the world to be buried there, we cannot wonder, that yet unknown shores, or the unknown bottoms of deep seas, should have furnished us with many unknown shell-fish, which may have been brought with the rest; whether that were at the time of the general deluge, or the effect of any other catastrophe of a like kind, or by whatever other means to be left in the yet unhardened matter of our stony and clayey strata. Hill's Hist. of Foss. p. 616.

Fossil shells are found to be of great use in manuring land. See MANURING.

SHELLS.

They are much used in France for this purpose; and Mr. Reaumur treats of their effects in fertilizing the earth very fully, concluding his useful account of these substances by observing, that it is much more easy to account for the manner of their acting upon land, than for the manner of their coming where they are found. It has been the favourite system of our Dr. Woodward, that all these shells were the remains of the universal deluge, which having overflowed the whole earth, might easily leave them in all places; but Mr. Reaumur has much more rationally accounted for their coming to those parts of France, where they are found at this time in such vast abundance, by carefully tracing the course of the beds of them, so far as known there, and easily proving that all that extent of country, under which they are found, may have been once overflowed by the sea without a deluge; it being the very track that a large body of waters, let in at one part of the kingdom, must have taken, in order to getting out at another. *Mem. de l'Acad. Par.* 1720.

SHELL, Arabian, a name given by some to a species of porcelain shell, not because it is found on the coast of Arabia, but because its lines and variegations are supposed to represent the figures of Arabic characters.

SHELL, Aurora, a very remarkable species of shell-fish, found in cabinets of the curious. It is of the figure of a bird, having a head, wings, and tail, and is of a flame-colour; it owes much of its beauty, however, to art and accident; the shell is an oyster of a peculiar variation of figure from the common one; the head of the bird is the cardo or hinge; the wings are the body of the shells; and the tail is a peculiar process, like that of the marteau, only single.

It is naturally of a dusky brown on the outside, and pearly within, but when its rough coat is taken off, it appears of this beautiful flame-colour.

SHELL, Caterpillar. See **TURBO**.

SHELL, Centre, a name given to the *balanus marinus*, a kind of sea-shell of the multivalve kind, with an open mouth, frequently found fixed to the bottoms of ships, and other things covered with sea-water. See **BALANUS** and **CONCHOLOGY**.

SHELL, Chalice, or *Cup-shell*, a species of the *balanus*. See **BALANUS**.

SHELL, China-letter, a name given by many to that species of chama, usually called by authors the *chama Arabica*. It is of a pale brownish ground, and is variegated with a great number of black lines, which are as slender as the strokes of a pen, and are of such odd figures, that they represent some of the Arabic, or, as others fancy, Chinese characters. See **CHAMA**.

SHELL, Crown Imperial, a species of the *voluta*.

SHELL, Dog-tooth, a species of *dentalis*.

SHELL, Ear. See **AURIS**.

SHELL, Guinea, the English name for a very beautiful variegated species of *voluta*, called by the French *la spe-culation*.

SHELL, Heart. See **CARDIUM**, under **CONCHOLOGY**.

SHELL, Helmet, the name of a kind of *murex*, of which there are several species. They all approach somewhat towards a triangular figure, and are free from any long spines.

SHELL, Leopard, the English name of the *pardus*, a kind of *voluta*, so called from its spots resembling those of a leopard. There are three kinds of this, one spotted with black, another with yellow, and another with red.

SHELL, Leveret, a name given by many to a species of porcelain-shell, resembling a young hare in colour.

SHELL, Lightning, a name given by some authors to a species of *murex*, with variegations on its body, resembling the pictures we commonly see of flashes of lightning.

SHELL, Map, the name given by some to a peculiar species of porcelain-shell, the figures on which represent the lines on a map.

SHELL, Needle. See **CENTRONIA** and **NEEDLE**.

SHELL, Noah's Ark. See **NOAH**.

SHELL, Oyster. See **OYSTER**.

SHELL, Old Wife, the name given by some to that species of *chama*, which the French also have called *vielle ridée*.

SHELL, Onion, a species of oyster.

SHELL, Pipe. See **ENTALIUM**.

SHELL, Saddle, the name of a species of oyster, which in some degree represents a saddle in its shape.

SHELL, St. James's, a name given by writers on shells to a very beautiful species of variegated pecten.

SHELL, St. Michael's, a name given by authors to a species of pecten, or scallop-shell. It is of a bright yellow colour.

SHELL, Scorpion, the name of a species of *murex*, very much approaching to the nature of the spider-shell. This is a common shell in cabinets; it is of a yellow colour, and very deeply ridged, and full of tubercles; there arise from the lip of the shell five large spines, or, as they are usually called, fingers, and two others, which are very much bent, the one from the head, the other from the tail: these are very elegantly radiated with white, and a fine violet colour on the lips.

SHELL, Screw. See **TURBO**.

SHELL, Small-pox, a name given to a remarkable kind of *concha venerea*, or porcelain-shell, the protuberances on the surface of which are supposed to represent the pustules of the small-pox. There are two species of this shell, the one white, with flattish protuberances, the other greenish, with more elevated ones.

SHELL, Snake, the name given by many to that beautiful species of porcelain-shell, the spots of which represent those of a snake's skin.

SHELL, Spider. See **ARANEA**.

SHELL, Strawberry, a name given by collectors of shells to a very beautiful species of *cordiformis*, spotted with small round red spots.

SHELL, Swallow, a name given by authors to a species of oyster, which in some degree represents the figure of a small bird flying.

SHELL, Tiger, the name of a species of porcelain, or *concha venerea*, supposed to represent the spots on a tiger's skin.

SHELL, Toe. See **POLLICIPES**.

SHELL, Tortoise. See **TORTOISE**.

SHELL, Trumpet. See **TRUMPET**.

SHELL, Turban. See **TURBAN**.

SHELL, Turnip. This is a species of sea-shell, by others called the *radish* shell; it is exactly of the shape of a turnip, and is of the *dolium*, or *concha globosa* kind. Those who have called it the *radish* shell, allude to the great black round-rooted radish, not to our common radish.

SHELL, Turtle, the name of two species of shells. See **MUREX** and **VOLUTA**.

SHELL, in Agriculture, a term applied to a hard, and as it were stony covering, with which certain substances and animals are defended, and thence in the latter case called shell-fish. It is observed that the vast beds of fossil shells found at great depths in the earth, as well as those found lying

SHELLS.

lying on the sea-shore, make an excellent manure for cold clayey lands. See SAND and CLAY.

It is likewise a term applied to the light calcined pieces of calcareous stones, which have been converted into lime; and also to the rind of turnips scooped by sheep, which are mostly applied to the purpose of feeding the store-sheep. See LIME and TURNIPS.

SHELL-Apple, in *Ornithology*, an English name for the loxia or crossbill, given from his manner of splitting an apple, and feeding on the kernels, leaving the shell of the pulp untouched.

SHELL-Drake, a common English name for the tadorna.

SHELL-Fish, a collective name for fishes naturally inclosed in shells. These animals are in general oviparous, very few instances having been found of such as are viviparous. Among the oviparous kinds, anatomists have found that some species are of different sexes in the different individuals of the same species, but others are hermaphrodites, every one being in itself both male and female: in both cases their increase is very numerous, and scarcely inferior to that of plants, or of the most fruitful of the insect class. The eggs are very small, and are hung together in a sort of clusters by means of a glutinous humour, which is always placed about them, and is of the nature of the jelly of frogs' spawn; by means of this they are not only kept together in the parcel, but the whole cluster is fastened to the rocks, shells, or other solid substances, and thus they are preserved from being driven on shore by the waves, and left where they cannot succeed.

SHELL-Gall-Insect, an insect of the gall-insect class, somewhat resembling those which are called the boat-fashioned ones, but differing in this, that as the two ends of that species are not very different in form, in this kind one of the ends is sharp and pointed in comparison with the other.

It has its name of shell-insect from the resemblance it bears to a muscle-shell; as it is, in its whole form, not unlike one of the two shells in which the common sea-muscle is inclosed, but the pointed end of this insect is much more extended in length than the smaller end of this shell.

This species is extremely small, and may be easily mistaken for the minute case out of which some small insect has escaped; or in another state, for the nest in which some small insect had deposited its eggs; but if the assistance of the microscope be called in, they will easily be discovered to be true gall-insects, even as soon as they are hatched from the eggs. This species, at its full growth, is so small, that it requires good eyes to discover it: it is brown, very smooth, and polished on the surface, and much of the colour of the bark of some trees; it has usually an edge of a cottony matter, visible where its sides touch the tree, and its eggs are always deposited on a fine cottony bed; the young ones are white, flat, and have two small horns, and six legs; in this state they are known to be of the gall-insect class, not by their likeness to their parent, but to the young gall-insects of other species. They march about very briskly for some time after they are hatched, and after that fix themselves, and then begin to grow, and by degrees alter their form, till they at length are of the same shape with their parent. Reaumur, Hist. Inf. tom. iv. p. 69, 70.

SHELL-Marle, in *Agriculture*, a substance of the marly kind, which is of a flaky or shelly nature. Though Mr. Marshall has not seen this material made use of in any of the southern parts of this country, he supposes it highly probable, that in the more northern counties it may be found in considerable quantity; and that in different parts of Scotland, it is in common use as a manure. And he considers it as usually

found in low moist situations, under what is termed bog-meadow, a sort of half-reclaimed morafs; namely, tough, coarse sward, formed upon a depth of black moory earth, which rests on the marle: this being, in some instances, several feet in depth. In respect to appearance, the colour is nearly white. Its consistence, in the pit, is that of soft curd, roughly broken; with the perceptible remains of small shells interspersed among it; and generally with some portion of earthy particles. It was found by analysis, that one hundred grains of a specimen taken in 1793, from the extraordinary pits on the estate of Auchtertyre, belonging to the late sir William Murray, on the southern skirts of the highlands of Perthshire, yielded eighty-two grains of calcareous earth: the residue being brown earthy matter, mostly, it is probable, animal mould, with a slight intermixture of vegetable fibres. One hundred grains, taken from a pit in Strath Tay, within the central highlands, yielded seventy-four grains of chalk; the residue being similar to the above. The search for this species of marle is so obvious and easy, that nothing but unpardonable neglect can suffer a quantity of it to remain within an estate (situated in a country where it is known to abound) unknown to its manager. Wherever, in valleys and dips of surface, level water-formed lands (whether they are already swarded over, or yet remain in a state of morafs) are found, there insert the borer: not in one place only, but in various parts of it, that no hollow receptacle of marle may be missed by the farmer.

And with marles of the fossil kind it is remarked, that where, by analysis, the proportion of chalk is found to be small, as not more than one-third of the whole; if the earthy matter with which it is combined appears to be of a rich fertilizing nature, such marle becomes, he thinks, a proper subject of trial in the field. And a good method for making this sort of trial, is to spread the marle, at a leisure time, as in winter, or the early part of summer, upon grass-land; and catching a favourable opportunity, when the soil is in a mellow friable state, between wet and dry, to break down and spread the lumps, with the roller and harrow, to give freedom to the grass, and an opportunity of gathering off the stones and rubbish, which may have been carried on with the marle; and in order that summer showers may wash the finer parts of it down into the soil, while it is open to receive them; repeating the operation as often as it may be required. And he knows no better method than this, by which to apply marles, on a large scale, in practice.

SHELL-Sand, a name given by the farmers, in some parts of England, to the fragments of shells found on the sea-shores, and ground to a sort of powder, so that they resemble sand. See MANURING.

There is also another kind, used as this is, in some parts of Cornwall, and composed of fragments of a sort of tender white coral. This is found principally about Falmouth, and is called by the same name of shell-sand, though very improperly. All the kinds are of great use in agriculture, but they are differently esteemed by the farmers, as they are more or less rich, which they know by their colours: the reddish kind is esteemed most of all; next to this the blue is judged the best, and after this the white. Such as is dredged up from under the water, is always found better than such as is found dry on the shores; and such as is entirely composed of shells is to be chosen, rather than such as has fragments of stone among it, which is a very common case. See SAND, and Shelly SAND.

SHELL-Toothed, in the *Manege*, an appellation given to a horse that from four years old to old age, naturally, and without

without any artifice, bears mark in all his fore-teeth, and there still keeps that hollow place with the black mark, which is called in French *germe de jeye*, i. e. *the eye of a bean*, inasmuch, that at twelve or fifteen he appears with the mark of a horse that is not yet six; for in the nippers of other horses, the hollow place is filled, and the mark disappears towards the sixth year, by reason of the wearing of the tooth. About the same age it is half worn out in the middling teeth, and towards the eighth year it disappears in the corner teeth: but after a shell-toothed horse has marked, he marks still equally in the nippers, the middling, and the corner teeth; which proceeds from this, that having harder teeth than other horses, his teeth do not wear, and so he does not lose the black spot.

Among the Polish, Hungarian, and Croatian horses, we find a great many of them hollow-toothed, and generally the mares are more apt to be so than the horses.

SHELL, in *Artillery*. See BOMB and MORTAR.

SHELLS, *Message*, are howitz-shells, within which are inclosed a letter, or other papers; the fuze-hole is stopped up with wood or cork, and the shells are fired into a garrison or camp.

SHELL of a Block, in *Mechanics*, is the outer frame or case, in which the sheave or wheel is contained, and traverses about its axis.

SHELL-Room, in *Ship-Building*, a compartment in a bomb-vessel, fitted up with strong shelves, excavated so as to receive the bomb-shells when charged; it is therefore built as secure as possible, to prevent accident from fire.

SHELLS, *Littoral*. See LITTORAL.

SHELL-Gold. See GOLD.

SHELL-Silver. See SILVER.

SHELL Island, in *Geography*, a small island near the coast of Carolina, in Pamlico sound. N. lat. $34^{\circ} 50'$. W. long. $76^{\circ} 30'$.

SHELL Key, a small island, or rather rock, in the gulf of Mexico. N. lat. $29^{\circ} 48'$. W. long. $89^{\circ} 15'$.

SHELLA, a walled town of Morocco, on the eastern side of Rabat, in N. lat. $34^{\circ} 3'$. This is sacred ground, and contains many Moorish tombs, that are held in great veneration; and the town is a sacred asylum, entered only by Mahometans. Shella was probably the Carthaginian metropolis on the coast of the ocean. Various Roman and ancient African coins were frequently dug up here, but their high price induced the Jews to imitate them, and thus to deceive amateurs, and hence has arisen a suspicion even of the antiquities themselves. The place is now in a state of decay; 4 miles E. of Salee.

SHELLACK POINT, a cape of the Isle of Man, forming the N. part of Ramsay bay.

SHELLDRAKE RIVER, a river of Canada, which runs into the river St. Lawrence, N. lat. $50^{\circ} 20'$. W. long. $64^{\circ} 50'$.

SHELLENBERG, a mountain of Bavaria, occupied by the Swedes, and strongly fortified in the 30 years' war; 3 miles N.E. of Donawert.

SHELLIFF, the *Chinala* of antiquity, a river of Africa, and the most considerable in the kingdom of Algiers, which rises in the northern side of the Atlas, and runs into the Mediterranean, N. lat. $36^{\circ} 10'$. E. long. $0^{\circ} 24'$.

SHELLNESS, a cape at the E. end of the island of Shepey. N. lat. $51^{\circ} 22'$. E. long. $0^{\circ} 50'$.

SHELLUHS, a class of the inhabitants in the dominions of the emperor of Morocco: they occupy the Atlas mountains, and the various branches of them S. of Morocco; living generally in towns, and, for the most part, occupied in husbandry like the Berebbers, though differing from them in

their language, dress, and manners. They subsist almost wholly on Affoua (barley meal made into gruel), and barley roasted or granulated, which they mix with cold water when travelling, and they call it "Zimata." They occasionally indulge in the use of "Cuscusoe," a nutritive farinaceous food, made of granulated flour, and afterwards boiled by steam, and mixed with butter, mutton, fowls, and vegetables. Many families among them are said to be descended from the Portuguese, who formerly possessed all the ports on the coast, but who, after the discovery of America, gradually withdrew thither. East of Morocco, near Dimenet, on the Atlas mountains, there is still remaining a church, having inscriptions in Latin over the entrance, supposed to have been built by them, which, being superstitiously reported to be haunted, has escaped destruction. Their language is called Amazirk.

SHELOPGUR, a town of Hindoostan, in the Carnatic; 18 miles N.W. of Tricolore.

SHELTER, in *Agriculture*, a term applied to the means of affording warmth, and procuring protection for lands and live-stock in situations which are too much exposed to storms and inclement seasons. This is mostly accomplished by the use of trees, which should be chosen of the most proper shapes and kinds for effecting the purpose, as those which are the most branchy from the ground, and the most permanent and close in their foliage. The fir tribe, the holly, and the beech, are probably the most suited to this intention, though there are great numbers that may be made use of in this way.

Proper shelter has the effect of producing much improvement in land, trees, plants, and live-stock. See SHELTERING PLANTATIONS.

SHELTER Island, in *Geography*, a small island at the E. end of Long island, in Suffolk county, New York, about five miles from E. to W., and seven from N. to S. It is fertile, and contains about 8000 acres; it was incorporated in 1783, and is said to contain 201 inhabitants. It furnishes cattle, sheep, and poultry.

SHELTERING PLANTATIONS, in *Agriculture*, the means of guarding and protecting them, so as to promote the growth and advancement of the young trees. This is frequently necessary, and of very great utility. In some very exposed situations, trees cannot indeed be raised to any advantage without it. The business is performed in different manners, according to their nature and circumstances. See PLANTATION.

SHELTERS, *HORIZONTAL*. See HORIZONTAL.

SHELTIE, the name of a small, but strong kind of horse, found in the island of Zetland, commonly called *Shetland*. In the country, the price of one of these horses was formerly about a guinea.

SHELVES, in *Sea Language*, a general name given to any dangerous shallows, sand banks, or rocks; lying immediately under the surface of the water, so as to intercept any ship in her passage, and endanger her destruction.

SHELVING-ROADS, in *Rural Economy*, are such as are formed in a somewhat shelving manner, either on both sides from the middle part, or in the whole from side to side. It is a mode that forms a great improvement in making roads in different situations; as a greater travelling breadth is gained without ruts being formed. And it is particularly applicable in making the side long roads on the declivities of hills, &c. See ROAD.

SHELVINGS, in *Agriculture*, a name applied to the moveable side-rails of a waggon or cart, which are occasionally put on for top loads.

SHEMEN,

SHEMEN, in *Geography*, a town of Curdistān; 44 miles N.W. of Kerkuk.

SHEMIUM, a town of Persia, in the province of Khorassān; 10 miles N.W. of Herat.

SHENANDOAH, a county of Virginia, bounded N. by Frederick, and S. by Rockingham. It contains 13,646 inhabitants, of whom 1038 are slaves. Its chief town is Woodstock.

SHENANDOAH, or *Shenando*, a river of Virginia, which rises in Augusta county, and after running a N.E. course of about 200 miles, joins the Patowmack in about N. lat. 38° 4', just before the latter bursts through Blue Ridge. This river is composed of four branches, S. river, Middle river, N. river, and Shenandoah, which, though the smallest branch, gives name to the united streams. It is navigable about 100 miles, and might be rendered so through its whole course, at a small expence. When this is done, it will convey the produce of the richest part of the state to Washington.

SHENANDOAH Valley, a valley which extends from Winchester in Virginia, to Carlisle and the Susquehanna in Pennsylvania, chiefly inhabited by Germans and Dutch.

SHENANGO, a town of Pennsylvania, in Crawford county, containing 727 inhabitants.

SHENAW, a town of Austria; 4 miles S. of Kirchschlag.

SHENCOTTY, a town of Hindoostān; 45 miles N.E. of Travancore.

SHENECTADY. See **SCHENECTADY**.

SHENGANA, a town of Hindoostān, in the Carnatic; 25 miles S.S.W. of Madura.

SHENKAFELD, a town of Austria; 5 miles W. of Freystadt.

SHEN-SEE. See **CHENSI**.

SHENSEN, in *Rural Economy*, a term applied, in some districts, as Devonshire, to dried cow and horse-dung, which is laid up and used as fuel for the winter season.

SHENSHIL, in *Geography*, a town of Egypt, on the right bank of the Nile; 2 miles N. of Achmim.

SHENSTONE, **WILLIAM**, in *Biography*, a poet of celebrity, was born at Hales Owen, in Shropshire, in the year 1714. His father was an uneducated gentleman farmer, who cultivated an estate of his own called the Leafowes, which the son afterwards rendered celebrated. William received the elements of instruction from a village dame, whom he has finely described in one of his poems. After this he was sent to the grammar-school at Hales Owen, whence he was removed to that of a clergyman at Solihull, from whom he not only acquired solid learning in classical knowledge, but a cultivated taste. In 1732 he was entered of Pembroke college, Oxford, where he did not make a large acquaintance, but he was one of a few who met at each other's rooms to read and examine the best works in English literature. Here it was he discovered his poetical genius, and produced some compositions of considerable merit, and he had thoughts of taking his degrees, and proceeding to study for a profession, but coming, by the death of his father, into the full possession of his paternal property, he gave himself up to literary ease, and rural retirement, abandoning at once all intentions of active pursuits; hence his biographer justly remarks, "that nothing is more unfavourable to the exertion of those energies which lead to a useful and honourable station in society, than the early possession of a fortune just sufficient to gratify present wishes, and preclude the necessity of immediate entrance into any vigorous course of action." An acquaintance which Shenstone formed with Mr. Graves of Mickleton, in Gloucestershire,

inspired him with an affection for that gentleman's sister; but the passion of love, which, in some minds, operates as a stimulus to enterprize, seems to him to have wasted its force on plaintive elegies, and other effusions of sentimental poetry. To one species of employment, indeed, he was probably animated by his visit to Mr. Graves,—that of rural embellishment,—which he afterwards bestowed on his favourite place of the Leafowes, with a taste that conduced more to his celebrity than his comfort.

In 1737 he printed, but without his name, a small volume of juvenile poems, which obtained scarcely any notice. In 1740 he came to London, and was introduced to Doddsley, who printed his poem of "The Judgment of Hercules," dedicated to lord Littleton. This was followed by "The School-mistress," of which the heroine was the village dame already referred to. This is thought, by some very respectable critics, to stand at the head of Shenstone's compositions.

Shenstone, from this time, devoted himself to improving the picturesque beauties of the Leafowes, and sometimes exercising his pen in effusions of verse and prose. The celebrity of this place led him into expences which his fortune was unequal to, and he was perpetually under the pressure of poverty; which, with the deficiency of regular employment, and the perpetual desire of doing more, and appearing better off than his means admitted, preyed on his spirits, and rendered him the miserable inhabitant of the Eden which his taste and genius had created. Grey has described him in the following sentence, which may in some respects be rather a caricature likeness. "Poor man! he was always wishing for money, for fame, and for other distinctions; and his whole philosophy consisted in living against his will in retirement, and in a place which his taste had adorned, but which he only enjoyed when people of note came to see and commend it." It has been thought a matter of surprize, considering his connections, that nothing was done to place him in easier circumstances. Application was said to have been made to lord Bute to procure him a pension from the privy purse, but before the wishes of his friends could be realized he died. This event took place in February 1763, when he was in the 50th year of his age: he was interred in the church-yard of Hales Owen.

Of his poetical compositions many were inserted in Doddsley's collection of original pieces; and after his death, his "Works in Verse and Prose" were published in two vols. 8vo. in 1764, and a third volume, consisting of "Letters," was published in 1769. "Of his poetry," says the critic, "the general opinion was almost uniform; it is regarded as commonly elegant, melodious, tender, and correct in sentiment, and often pleasing and natural in description; but verging to the languid and feeble, and never exhibiting either the powers of the imagination, or the energy and splendour of diction, that characterize compositions of the higher order. His prose writings display good sense and a cultivated taste, and contain just and sometimes new and acute observations on mankind."

SHENUZAN, in *Geography*, a town of Candahar; 42 miles E. of Ghizni.

SHEPEY, *Isle of*, an island within the liberty of the same, lathe of Sway, and county of Kent, England, is situated near the mouth of the river Thames, and is separated from the mainland by a narrow arm of the sea, called the Swale, which bounds it on the south, while the estuary of the Medway, and the German ocean, bound it on the west, north, and east. It is uncertain by what name this island was known to the Romans; for though Ptolemy, in his *Geography*, mentions two islands in this part of Britain by the

the appellations Toliapis and Counus, he does not describe either of them so precisely as to identify it with Shepey. Hence this subject is a matter of dispute among our most eminent antiquaries; Camden and Batteley contending for Toliapis; and Lambarde, Leland, and others, for Counus. In Saxon times it was called Sceapige, or the island of sheep, from the great numbers of that animal which were then pastured upon it, whence originated, by corruption, the name by which it is now distinguished. Baxter, in his Glossary, under the word Malata, remarks, "Vervicum Patria, or the isle of sheep, now named Shepey. This is corruptly called by the book of Ravennas, Malaca, by the Britons Vervex;" but these observations are rather conjectural than well authenticated.

The Isle of Shepey, including the small adjoining isles of Elmley and Hartly, which lie at the south-east side of it, measures about 32 miles in circumference, being about 11 miles long and six broad. On the southern side the lands are flat and marshy, but the interior is diversified by hills, and the northern shore presents a range of cliffs, extending six miles in direct length. These cliffs are chiefly composed of a loose friable marl, abounding in pyrites, and in some places rising perpendicularly to the height of 90 feet. They belong principally to the three manors of Minster, Shurland, and Warden, the owners of which let them to the copperas makers, who employ the poor inhabitants to collect the pyrites, or copperas stones, which are continually washed out of the cliffs by the force of the waves, and are of various forms, as globular, oblong, &c. Their external covering is a ferruginous coat; and within they are of a striated texture, commonly radiated from a centre. The ludi Helmontii also abound in these cliffs. They are in general of a compressed form, from twelve inches to two feet and a half long, and covered with a thick crust of indurated clay. Where the clay is most tenacious, selenites are found of several varieties. Large nodules of petrified wood, retaining the appearance and grain of oak, are likewise met with in these cliffs and on the shores; also a vast number of fruits; but as these are always saturated with pyritical matter, they soon fall to pieces. Animal remains have likewise been found here of many different kinds; as the thigh-bones, tusks, and grinders of elephants; two species of tortoises; the heads, tails, and palates of fish; the teeth and vertebræ of sharks; crabs, lobsters, shells, &c.

The greatest part of this island is of an exceeding stiff clay soil, and consists chiefly of upland pastures and marsh lands. Towards the north side, however, in the parishes of Minster and Eastchurch, it is very fertile in corn, the inclosures of which are small, and surrounded with thick hedge-rows of elm. The roads throughout the island are very good during the whole year, owing to the great plenty of fine gravel found in the beach-pits, and the prospects from them are very pleasing and extensive on every side. Fresh water is very scarce, and the greatest part of it brackish, though between Eastchurch and Minster there are a few springs, which, notwithstanding they rise near the sea, the waters of them are perfectly good and fresh. The air is generally thick, and much subject to noxious vapours, arising from the large quantity of marshes in and near it. Hence, and from the badness of the water, few people of substance live in it, the inhabitants consisting in general of lookers, bailiffs, farmers, and servants. The garrison and dock of Sheerness and its environs, the reader will however of course except from this observation, where there are many gentlemen employed in the government service constantly resident. See SHEERNESS.

The water which flows between this island and the main

land is called the Swale, and the two extremities of it the East and West Swale. It reaches about twelve miles in length, and is navigable for ships of two hundred tons burthen. This water seems formerly to have been accounted a part of the river Thames, and to have been the usual, as being the safest, passage for the shipping between London and the North Foreland. Accordingly Sandwich is frequently tiled by our ancient historians *Lundenwic*, or the Thames mouth, being the name given to it by the Saxons, and the town of Milton is said by them to stand on the south bank of the Thames. Leland in particular says, in his Itinerary, "that towne stands on an arm of the Tamise;" and he speaks of the point against "Quinborough entering into the mayne Tamys."

The usual passage to this island is by a ferry, called King's Ferry, for carriages, horses, cattle, and passengers. The ferry-boat is moved forward by a long cable, of about one hundred and forty fathoms, or more, which being fastened at each end across the Swale, serves to move it forward by hand. On the side opposite to the island there is a small house of stone, in the room of one formerly erected by one George Fox, who having staid a long while in the cold waiting for the boat, and being much affected by it, built it to shelter others from the like inconvenience.

The very convenient situation of the Isle of Shepey for the devastating pursuits of the Danes, occasioned it to be made their accustomed rendezvous; and they sometimes wintered here during the course of the ninth century. The inhabitants were then but few, and chiefly congregated in the neighbourhood of Minster, where Sexburga, widow of Ercombert, king of Kent, had founded a nunnery, which, after being several times plundered by the invaders, was at length, in a great measure, destroyed, and the nuns dispersed. The large tumuli in the lower or southern part of the isle, and which are termed coterets by the country people, are supposed to cover the remains of different Danish chiefs, who were slain in battle during their piratical incursions. The years which have been particularly recorded as those wherein these marauders were most active here, are 832, 849, 851, and 854: in the year 1016, king Canute is said to have collected the scattered remains of his army in this isle, after his defeat in the vicinity of Otford, by Edmund Ironside. Haisted's History and Antiquities of Kent, 8vo. 1798. Beauties of England and Wales, vol. iii. by E. W. Brayley and John Britton, 8vo. 1806.

SHEPHERD, in *Agriculture*, a labourer or other person who has the care and management of a flock of sheep. It is a business that requires much care, attention, and knowledge of the various methods of treating animals of this kind. Mr. Bannister thinks, that it is necessary to have for this employment a person who is well skilled in the nature and management of sheep, and hath been brought up in that employment from his infancy; who is sober, diligent, and good-natured; qualities essentially necessary in a shepherd, who, although he may seem to live a life of indolence, when contrasted with the more laborious servants of the farm, need rarely to have a minute's time hang heavily on his hands, if he will be attentive to his business, which will furnish him with sufficient employment throughout the day, particularly in the lambing season, or where there are two folds at work; nor will he want opportunity for the exercise of his patience and good temper in his attendance on the sheep, which are by nature animals of great obstinacy and perverseness, and which have often paid the forfeit of their lives to these innate qualities, where the shepherd was a man of morose and surly disposition. It is said that on the continent they have schools wherein young shepherds are instructed in the necessary

cellary knowledge of their business, as well as the anatomy and physiology of sheep, the food and treatment proper for them in different seasons, and the nature of their diseases, and the common operations respecting them, especially regarding the parturition of the ewes, &c. And in the General Treatise on Cattle, it is remarked, that the method of encouragement, adopted in some districts, of allowing the shepherd to possess a small flock, or as many ewes as his means will allow, is probably one of the most powerful. It gives him that steadiness appertaining to property, and is an additional and strong incentive to the attainment of knowledge in his business. A shepherd should be naturally active, both in body and mind, clear-headed and clear-sighted; such an one, for instance, as can distinguish the individual countenances of a numerous flock, and running over them with his bodily and mental eye, instantly give the exact number and condition; or perceive at a glance, a bird's nest in the thickest quickset. Fond of animals and attractive to them, the latter quality of which is well known to inhere in some persons; possessing a musical voice and shrill whistle; hardy, patient, watchful; satisfied with little sleep, and temperate in drink. It is conceived that he ought never to be suffered, if he profess, to practise physic, nor any but the most easy and common operations, a farce that too often ends in a tragedy; for if of two evils we ought to choose the least, the office of medical practice had better devolve on the malter. And for his comfort in the severe weather, in some situations, the moveable wooden house on wheels may be of use. Also that he ought to be clad during winter, with substantial woollen next his skin, from his feet upwards, as the best defence against those rheumatic ails to which he must be necessarily subject; and he should always go provided with the instruments proper to his profession, ready for immediate occasions, namely, scissiors, knife, steel, fleam, salve-box, &c. And in folding, as the shepherd will have the flock perpetually under his eye, the first writer thinks, he will be capable of judging with certainty and precision respecting the state of every individual, so that the earliest remedy may be applied to every disorder, and such sheep may be turned out of the fold which are found not to be able to go through their work without manifest injury to their health; and if a sheep or lamb be seized with a dangerous and incurable malady, to kill and dress it immediately; for it is one part of the business of a shepherd to be so far skilled in the butcher's trade, as to be able to slaughter, flea, and dress a sheep on occasion. Farther, that a good shepherd will be careful that his flock be driven late to fold of an evening, and released early in the morning from their confinement, in order that they may enjoy the coolest parts of the day on the food. He will be cautious that they are allowed a sufficient time to graze in the uplands previous to their being driven into the fold, that they may retire to rest with full bellies, by which the quantity of the dung and urine will be considerably augmented. He will likewise be careful in reviewing the hurdles, and providing that these are fixed in the ground, lest by any accident they should be thrown down during the night, and the flock by these means get into mischief, or intermix with other sheep; he will count his sheep regularly every evening when he drives them to the fold, and take a fresh tale in the morning, when he turns them on their feed; he will, previous to dismissing them from the fold, worry them gently round the same, in order to cause them to dung and stale plentifully, that the manure may be left in the field, otherwise the greatest part of the trundles will be dropt on the road, or carried on to the marsh, where lying thin, this dressing can do but little service, and where in truth it is not wanted; he will bestow

a particular attention on every individual in his flock, and for those which shew any appearance of being stung by the fly, he will be prepared with a pair of sheers to clip away the wool from the part, and having taken out the maggots, will anoint the place with a mixture of train-oil and brimstone; but if slightly attacked, he will destroy the maggots by strewing on them powder of white lead; and if any of the flock should haply break with the scab, a disorder to which folding sheep are continually subject, and which seldom fails to shew itself in the spring and fall, he will be provided with a proper remedy to keep it under, and prevent the contagion from spreading. See SCAB.

It is likewise thought, that one shepherd will be able to look after three hundred sheep.

In respect to the necessity of a dog, as an assistant to the shepherd, Mr. Lawrence thinks, that it has of late very rationally become a question among the most intelligent sheep-masters: it may probably be thus settled,—there can be no occasion for such aid, nor any necessity for incurring the danger of it, amidst convenient inclosures, or where quiet breeds of sheep are kept, and where it is made an object to render them tame and docile: and if upon extensive wastes and mountain districts, the service of dogs cannot well be dispensed with, it ought to be made a main point, that they be trained early to a kindness for the sheep, and to view them rather as their companions, than their prey; a thing which he knows by experience to be most easy; and he also knows that such dogs are infinitely of the greater use, as the sheep, far from dreading or shunning, will run to them, in case of need, for protection; and he has often witnessed the caresses and gambols of these and the lambs, with a delight which he never experienced in the combats of animals.

SHEPHERDS of Egypt, *Shepherd kings*, or *royal Shepherds*, in *Ancient History*, the denomination of a class of inhabitants of a part of Egypt, concerning whose origin, place of abode, and migration, ancient and modern writers have entertained different opinions. Some sketches of their history will be found under the articles AURITÆ, CUSH, DISPERSION of Mankind, and EGYPT. The learned Bryant has published, besides several notices that occur in his "Analysis of Ancient Mythology," an elaborate "Dissertation" on this subject. Differing from others concerning the situation of the land of Goshen, (see GOSHEN,) he conceives it to have been the Nome called the Arabian, from the Arabian shepherds who had formerly settled in those parts, and held them for many years, and denominated by the LXX, ΓΕΩΡΓΗ ΤΗΣ ΑΡΑΒΙΑΣ. The province of Arabia, says this author, was one of the three most remarkable nomes, the other two being those of Bubastus and Heliopolis. These three nomes were contiguous to each other, and towards the summit of Lower Egypt. The nome of Heliopolis, according to his statement, was a Mediterranean district; and consequently the two provinces, or that of Phacusa (*i. e.* the Arabian nome), and that of Bubastus, that are always mentioned with the former, were so likewise. Phacusa, mentioned by Strabo only as a village, was the province at whose summit the Nile was first divided, where stood the city of Cercafora. It was called the Arabian nome for the reason above-mentioned, and had for its metropolis Phacusa, and the places situated upon its borders were Babylon, Heliopolis, and Heroum. From Syncellus we learn, that Egypt had been in subjection to a three-fold race of kings, who are termed the Auritæ, the Metræi, and the Egyptian. The Auritæ were the Arabian shepherds and their kings, who reigned here a considerable time, maintaining themselves by force; till, after many struggles, they

they were finally expelled by the natives. According to Manetho, the whole body of this people bore the appellation of Hukfos, that is, royal shepherds; the first syllable, in the sacred dialect, signifying *a king*, and the latter, in the popular language, signifying *a shepherd*; and by a composition of these two was formed the word Hukfos. These people are said to have been Arabians. Josephus further informs us from Manetho, that the shepherds maintained themselves in Egypt 511 years. At last the people of Upper Egypt rose in opposition to them, and after some time expelled them the country. However, on their departure, they were afraid of going towards Assyria, and therefore resorted to the country called afterwards Judea, and built Jerusalem. We learn also, from the same authority, that another class of people sojourned in Egypt in the reign of Amenophis; and that they were treated as slaves by the prince of the country, because they were infected with the leprosy. As their number very much increased, he employed them in the stone quarries that lay on the east side of the Nile, in company with some of the Egyptians. Upon a remonstrance afterwards made to him, he granted them for a retreat the city of Abaris, where the former shepherds had resided, that now lay desolate. The people belonging to each of the two classes now mentioned were esteemed shepherds: the first shepherds were lords and conquerors; the others were servants, to whom was assigned the city which the former had evacuated. The latter were Israelites, as appears from the name of their leader and lawgiver, Moses; and the former were Arabians, who are said to have come from the East: and they are, without doubt, the Auritæ, who founded the city Auris or Abaris, which is no other than the city אור, Ur or Aur, signifying light and fire, of which element the Auritæ must have been worshippers, as all the Arabians were. Their chief god was Alorus, (Al Orus,) the god of fire. Accordingly the shepherds were called Auritæ from the chief object of their worship, and their kings were styled priests of Alorus, or, according to the Greeks, priests of Vulcan. Hence it has been inferred that they came from Babylonia, a country that lay due east from Egypt, which country was the original seat of the genuine Arabians, and the true source whence their religion flowed. The two principal cities of that country were Ur or Aur, and Babylon: in memory of which they built two of the same name in Egypt. Wherever they resided, they introduced the Tzeba Schanain, or Zabian worship, together with the worship of fire. Hence we are informed by Herodotus, that Vulcan was particularly honoured at Heliopolis and Memphis, which places they are said to have built. The true name of these people, says Bryant, who were called by the Greeks and Romans Arabians, was Cushman or Cusæans, the same that they gave to the province where they settled. (See CUSH.) These strangers, therefore, who settled in Egypt, were no other than the Cusæans; and they have been styled Arabian shepherds, because all the primitive Arabians were Nomades, or shepherds. These people becoming lords of the country, undoubtedly chose that part which was the most eligible, and their profession would lead them to the best land for pasturage; in respect of which Goshen had not its equal. For it was part of the πεδιον Αιγυπτου, the rich champaign of Egypt; so that this circumstance among others would induce one to think that they settled here. This is confirmed by the worship which they settled in these parts; the cities they built; and the names which they bequeathed to the province. According to the Mosaic account, the land of Goshen is repeatedly said to be in the land of Egypt, "in the best of the land;" and yet the LXX call it

Γοσημ της Αραβιας, which could be owing to no other reason besides its being the land of Cushman, (Goshen,) which was interpreted Arabian; for in Arabia it was not situated. Hence it has been concluded, that the place where the children of Israel resided in Egypt was the principal Arabian nome, at the extreme and highest part of Lower Egypt, called Cushman.

This was the land to which the children of Israel succeeded, after it had been abandoned by its former inhabitants; but it is uncertain at what interval. It appears to have been an unoccupied district; and as it was the best of the land, there is no accounting for its being unoccupied but by the secession of the Cusæans, whose property it had lately been. Accordingly Manetho expressly affirms, that the second shepherds succeeded to the places which had been deserted by the former; and he moreover says, that the city Abaris, which had been built by the first shepherd king, was given to those of their body who were employed in the quarries.

Bryant suggests, that the migration of the shepherds was about the time of Serug or Nahor: and this is the time when archbishop Usher supposes it to have happened, who refers it to the year of the world 1920, according to the Hebrew computation, in the 101st year of the life of Serug, the 7th from Noah, and in the 42d year of Terah, 88 years before the birth of Abraham. Bishop Cumberland supposes that the shepherds invaded Egypt A. M. 1937, in the time of the same patriarchs, according to the Hebrew chronology. Our author has alleged several arguments to prove, that the Arabian shepherds were distinct from the Israelites, and prior to them. When the Arabians came into Egypt, they are said to have been 240,000 in number, whereas the Israelites were but 70 persons. The former took possession by force, the latter were invited, and had a grant of all that they possessed. The one held the people in slavery; the others were themselves enslaved. The Arabians were driven out of the land; the Israelites were not suffered to depart. See Bryant's Observations and Inquiries, &c. Cont. 1767.

SHEPHERD'S *Islands*, in *Geography*. See *NEW HEBRIDES*.

SHEPHERD'S *Dog*, a variety of the common dog, used in guarding flocks, or driving herds of cattle. See *DOG*.

SHEPHERD'S *Needle*, or *Venus's Comb*, in *Botany*. See *SCANDIX*.

SHEPHERD'S *Pouch*, *Bursa pastoris*, a common weed in most parts of England, which propagates itself so fast by seeds, as not to be easily cleared where they are permitted to shed; for so fast do the seed ripen, and the plants come up, that there are commonly four or five generations of them in a year; they cannot, therefore, be too carefully rooted out of a garden or field. It is early, and lasts most part of the year. It may be destroyed by frequent ploughing, and preventing its going to seed. In the Linnæan system, this is a species of the *thlaspi*.

This is an officinal plant; its juice has been reputed astringent and vulnerary, and as such is used against hæmorrhages, dysenteries, diarrhæas, &c.

The country people apply it to cuts and fresh wounds, and some hold it of great virtue when made up into a cataplasm, and applied to the wrists against tertians and quartans; but Dr. Lewis observes, that he could perceive no pungency or astringency, either in the leaves of this plant, or in the extracts made by water and rectified spirit, and that a decoction of them strikes no degree of blackness with solution of chalybeate vitriol. Hence he infers, that there seems to be no foundation for the strong styptic virtues, for which this herb has been generally recommended by writers.

in the *materia medica*, or for the acrid inflammatory power which some (probably misled by its botanic affinity with mustard, and some other acrid vegetables) have ascribed to it. Lewis's *Mat. Med.*

SHEPHERD'S *Staff*, or *Shepherd's Rod*. See TEAZLE.

SHEPHERDSTOWN, in *Geography*, a post-town of America, in the state of Virginia, and county of Jefferson, on the S. side of Patowmack river. Its situation is agreeable and healthy, and the neighbouring country fertile and well cultivated. It is said to contain 1033 inhabitants, chiefly of German extraction.

SHEPHERDSVILLE, a post-town in Bullet county, Kentucky; 640 miles from Washington.

SHEPPECK, in *Agriculture*, the provincial name of a prong or sort of hay-fork, employed in some places.

SHEPPEY, in *Geography*. See SHEPEY.

SHEPREVE, JOHN, in *Biography*, an English poet, was born in Berkshire, and educated at Corpus Christi college, Oxford, where he took his degrees in arts, and became Hebrew professor about the year 1538. He had a most surprising memory, and was one of the most learned men in his time. He died in the year 1542. His works are "Summa et Synopsis Novi Test." &c.; "Hippolytus Ovidianæ Phædræ respondens," &c. Wood.

SHEPTONMALLET, in *Geography*, a market-town in the hundred of Whitestone and county of Somerset, England, is situated about five miles E. from the city of Wells, and 115 W. by S. from London. This town has been long celebrated for its manufacture of woollen cloths and knit stockings, which affords employment to upwards of 2000 persons resident in the town or its vicinity. Edward II. granted a charter for a market to be held here on Monday, weekly; but it is now kept on Friday; besides which there is an annual fair, called Silver-street fair, which takes place on the 8th of August. The market-place is remarkable for a very curious stone cross, which appears, from an inscription upon it, to have been erected in the year 1500, by "Walter Bucklond and Agnes his wyff." It consists of five arches, supported by pentagonal pillars, with an hexagonal column in the centre. From the roof, which is perfectly flat, rises a lofty pyramidal spire, adorned with Gothic niches, and crowned with an oblong entablature, on which are represented figures of our Saviour on the cross between the two malefactors; also those of several saints. Lands of considerable value are appropriated for the repair of this singular structure. The church here is a large and handsome edifice in the pointed style of architecture, and composed of a nave, chancel, north and south side aisles, and transept, with a tower at the west end, ornamented with effigies in niches of the Virgin Mary, St. Peter, and St. Paul. The pulpit and font are each cut out of one solid stone, and from the rudeness of their workmanship would seem to be of very great antiquity. In two of the windows are some remains of painted glass, displaying the mutilated effigies of knights Templars, said to represent the two Williams Mallet, who had commands in an expedition to the Holy Land during the reign of king Henry II. The monuments in this church are numerous, but none of them are particularly remarkable, either for their style of execution, or for the character of the persons they commemorate.

Shepton Mallet, in ancient times, formed part of the manor of Pilton, which king Ina gave to the abbey of Glastonbury, A.D. 705. At the time of the Conquest it was held from the abbot by Roger de Curcelle; but soon afterwards passed into the possession of the barons Mallet, from whom it derived the latter part of its name. After a

variety of changes, this manor was divided into two moieties, one of which came to the crown, and was annexed to the duchy of Cornwall, to which it still belongs. The other moiety became the property of the family of Sherston.

Shepton Mallet is noted as the birth-place of three men of distinguished talents and learning; viz. Hugh Inge, D.D. archbishop of Dublin, and chancellor of Ireland, who died in 1528; Dr. Walter Charleton, an eminent physician, and author of *Chorea Gigantum*, or an account of Stonehenge, who died in 1707; and Simon Browne, a learned dissenting minister, celebrated for his controversial writings against Woolston and Tindal, who died in 1732.

The parish of Shepton Mallet is of small extent, but populous, containing, according to the parliamentary returns of 1811, 1129 houses, and 4638 inhabitants. Within its bounds are situated the county Bridewell, and a large parish workhouse. The History and Antiquities of the County of Somerset; by the Rev. J. Collinson, F.S.A. 4to. vol. iii. Bath, 1791.

SHERARD, WILLIAM, in *Biography*, a very learned and munificent botanist, on whom the titles of prince and Mæcenas of botany have been, more justly than usual, bestowed, was the son of George Sherwood, (for so it seems the name was written by the father,) of Bushby, in Leicestershire. He was born in 1659; educated first at Merchant Taylors' school, and then at St. John's college, Oxford, where he entered in 1677. He subsequently became a fellow of this college, and took the degree of Bachelor of Law, December 11, 1683. Being appointed travelling tutor, successively, to Charles, afterwards the second viscount Townshend, and to Wriothesley lord Howland, son of the murdered lord Russell, who in 1700 became the second duke of Bedford, Sherard made two successive tours through Holland, France, Italy, &c. returning from the last, as we presume, not much before the year 1700, when his last-mentioned pupil was twenty years old. Dr. Pulteney supposes him to have come back in 1693, led perhaps by the date of Ray's *Sylloge Stirpium Europæarum*, printed in 1694, to which Sherard communicated a catalogue of plants gathered on mount Jura, Saleve, and the neighbourhood of Geneva. These were probably collected in his first journey; for it should seem by Collins's Peerage, that the lord Howland, so created on account of his union with the heiress of the Howland family, was married to her in May 1695, when he was little more than fourteen years of age. He was made a peer June 13, 1695; "after which," says Collins, "he travelled into France and Italy." So youthful a bridegroom was, doubtless, best in the hands of his tutor, in a distant country from his, still more youthful, spouse. The subject of our memoir is said to have fulfilled his trust to the satisfaction of both the noble families who confided in him. His visit to his friend sir Arthur Rawdon, at Moira, in Ireland, was apparently made in the interval of these two foreign journies. Long before either of them, he had travelled over various parts of England, and proceeded to Jersey, for the purpose of botanical investigation; and the fruits of his discoveries enriched the publications of the illustrious RAY; see that article.

Botany was ever the prominent pursuit of Sherard in all his journies. He cultivated the friendship and correspondence of the most able men on the continent, such as Boerhaave, Hermann, Tournefort, Vaillant, Micheli, &c. He is universally believed to have been the author of a 12mo. volume, entitled *Schola Botanica*, published at Amsterdam in 1689, and reprinted in 1691 and 1699. This is a systematic catalogue of the Paris garden. Its preface, dated London, Nov. 1688, is signed S.W.A., which the French

French writers have interpreted Samuel Wharton, Anglus, under which name the book occurs in Haller's *Bibliotheca Botanica*, v. 1. 643. But as no one ever heard of such a botanist as Wharton; and the preface in question displays the objects and acquisitions of one of the first rank, who could certainly not long remain in obscurity, the above initials are presumed to mean William Sherard, to whom alone indeed, with or without a signature, that preface could belong. Its writer is described as having attended three courses of Tournefort's botanical lectures, in 1686, 87, and 88, all which years, he says, he spent at Paris. In the summer of 1688 he describes himself as having passed some time in Holland, collecting specimens of plants from the rich gardens of that country and getting them named by professor Hermann himself, who allowed him to peruse the manuscript rudiments of his *Paradisus Batavus*, to examine his herbarium, and to compose a *Prodromus* of that work, which is subjoined to the little volume now under our consideration. All this can apply to Sherard only, who became the editor of Hermann's book itself, and who in its preface, dated from Geneva in 1697, appears under his own name, and speaks of himself as having long enjoyed the friendship and the communications of that eminent man, whose judgment and talents he justly commemorates, and of whose various literary performances, as well as of his botanical principles, he gives an account. Dr. Pulteney conceives this preface to have been written during a third tour of its author to the continent; but we presume him to have then been with the young lord Howland, and consequently on his second tour only.

Sherard communicated to the Royal Society, in 1700, a paper relative to the making of Chinese or Japan varnishes, which is printed in the Philosophical Transactions, v. 22. The information which it contains was sent by the Jesuits to the grand duke of Tuscany, and probably obtained by our author at Florence.

He now entered on a more public walk of life, becoming one of the commissioners for sick and wounded seamen at Portsmouth, and about the year 1702, or soon after, was sent out as British consul to Smyrna. Here his botanical taste met with fresh gratification; nor was he neglectful of other curiosities of science or literature. He visited the seven churches of Asia, copied several ancient inscriptions, and communicated to the Royal Society an account of the new volcanic island, near Santorini, which rose out of the sea May 12, 1707.

Botany, however, continued to be his leading object. He had a villa at Sedekio, near Smyrna, where he could with the more ease resign himself to the contemplation of plants, and where he began that great herbarium of which we shall speak hereafter. Hasselquist visited this spot, with the devotion of a pilgrim, in the spring of 1750. He saw the house, with a small garden laid out by Sherard, but not enriched at any great expence, nor stored with extensive collections of exotics. Many of the latter indeed might, in the course of thirty-two years, have disappeared. Whatever specimens Sherard could obtain from Greece, and the neighbouring countries, he here carefully preserved; and being well aware of the insufficiency of Bauhin's *Pinax*, as a clue to the botanical knowledge then in the world, he is said to have here formed the project of continuing it, and even to have made some progress in that arduous undertaking, before he returned to his native country in 1718. Soon after his return he received at Oxford the degree of L.L.D.

In 1721 Dr. Sherard revisited the continent. Vaillant was now in a declining state of health, and died in May

1722. Previous to his decease he concluded, through the mediation of Sherard, the sale of his manuscripts and drawings of Parisian plants, to Boerhaave, who published in 1727 the splendid *Botanicon Parisiense*. This work, though not free from imperfections in the distribution of its materials, would doubtless have been far less correct, but for the superintendence of Sherard, who passed a summer with Boerhaave in revising the manuscript. Our great botanist had already rendered a more important service to his favourite science by bringing with him from Germany, in August 1721, the celebrated DILLENIUS (see that article). By a comparison of dates, it appears that Sherard made several visits to the continent. He went from Paris to Holland in 1721, and thence with Dillenius, the same year, to England. He stayed some time with Boerhaave again in 1724, or perhaps 1725. We know not precisely when or where it happened that he was, like Linnæus in Norway, in danger of being shot for a wolf, or a thief, by some half-humanized rustic, akin to the thief-takers and Oxfordshire justice, who seized upon another illustrious botanist, of our time, as a highway-man.

What principally attached Sherard to Dillenius, was the similarity of their tastes respecting those intricate tribes of vegetables, now termed cryptogamic. To these the attention of both had long been directed, and hence originated the cultivation, which this line of botanical study has received, from that period, in England and Germany. This taste, however, was not exclusive; for these friends and fellow labourers left no department of botany unimproved. James Sherard, seven years younger than his brother, who had acquired opulence by medical practice, first as an apothecary, and then as a physician, in London, had a great fondness for the same pursuit, and reared at his country seat at Eltham, a number of exotic plants, from every climate. Hither the more learned subject of our present article frequently resorted. He had acquired affluence by his public appointments, but his style of living was simple and private. Devoted to the cultivation of knowledge in himself, and to the diffusion of that of others, he lent his aid to all who required it, without coming forward conspicuously as an author. He assisted Catesby with information and with money, to bring out his *Natural History of Carolina*, though neither that work, nor the *Hortus Elthamensis* of Dillenius, appeared till some time after his decease, which happened on the 12th of August, 1728, when he was 69 years of age. Of the place of his interment we find no mention. His brother died Feb. 12, 1737, aged 72, and is buried in Evington church, near Leicester, with his wife, whose maiden name was Lockwood, by whom he had no children.

The most ostensible and splendid service to botany, though it for a long time yielded but little fruit, was rendered by the will of Dr. William Sherard, who left 3000*l.* to found and support a botanical professorship at Oxford, of which we have spoken under the biographical article DILLENIUS. He bequeathed to this establishment his choice botanical library, his ample herbarium, and the manuscript of his *Pinax*, the completion of which he intended should be one of the objects and duties of the new professor. We have already expressed our doubts whether the failure of the latter, in this point, were any great loss to science. Nevertheless, the manuscript, as Sherard left it, would probably have been a great acquisition to the world, and might still be worthy of publication. Dillenius accomplished more appropriate, and perhaps more difficult designs; but every scientific object slept with his successor for forty years. Sherard has sometimes been blamed for excluding clergymen from

from his professorship, and it is usual to hear a complaint at Oxford, that this order of men has no *interest* therein. If by interest is meant the acquisition of a very moderate stipend, which only one can enjoy, the complaint is just: but surely the more important interest of a whole university consists in having this, or any other, science taught in the best manner. Sherard therefore would have done much more wisely, instead of limiting the appointment at all, to have left it open, like the Cambridge professorship and garden, to all the world; and to have placed the choice in the hands of those who would perceive their own advantage, and probably feel some sense of duty, in not making any professorship a sinecure or a job.

The herbarium of Sherard is perhaps, except that of Linnæus, the most ample, authentic, and valuable botanical record in the world. In it may be seen original specimens from Tournefort, and all the writers of that day, named by themselves, accompanied by remarks, or by queries scarcely less instructive. He collected also copies of original drawings, from botanists whose specimens were not to be had, such as Plumier. The most rare, and even unique, books are to be found in his library, as the first volume of Rudbeck's *Campi Elysi*. (See RUDBECK.) All these precious collections are still in good preservation, though the noble stone building, originally constructed to receive them, was sacrificed a few years since to public convenience, that the adjoining street might be widened.

The name of Sherard has been commemorated by Vailant, in some plants referred by Linnæus to *Verbena*. Dillenius established a *Sherardia*, which has remained; see the next article. Pulteney's Sketches of Botany. Haller's Letters, and Bibl. Bot. Aikin's Gen. Biog. S.

SHERARDIA, in *Botany*, so named by Dillenius, in honour of his munificent and learned patron William Sherard. (See the last article.)—Dill. Giff. append. 96. t. 3. Linn. Gen. Pl. 50. Schreb. 67. Willd. Sp. Pl. v. 1. 574. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 171. Prodr. Fl. Græc. Sibth. 86. Ait. Hort. Kew. v. 1. 234. Juss. 196. Lamarck Illustr. t. 61. Gært. t. 24.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Stellate*, Linn. *Rubiaceæ*, Juss.

Gen. Ch. *Cal.* Perianth superior, small, with six teeth, permanent. *Cor.* of one petal, funnel-shaped; tube cylindrical, various in length; limb flat, in four acute deep segments. *Stam.* Filaments four, inserted into the top of the tube, between the segments of the limb; anthers roundish, two-lobed. *Pist.* Germen inferior, oblong, two-grained; style thread-shaped, divided at the upper part; stigmas blunt. *Peric.* none. Fruit oblong, crowned, separating lengthwise into two parts. *Seeds* two, oblong, convex at the outside, flat on the other, each crowned with three points.

Eff. Ch. Corolla of one petal, funnel-shaped, superior. Seeds two, naked, each crowned with three teeth.

1. *S. arvensis*. Blue Sherardia, or Little Field Madder. Linn. Sp. Pl. 149. Willd. n. 1. Fl. Brit. n. 1. Engl. Bot. t. 891. Curt. Lond. fasc. 5. t. 13. Fl. Dan. t. 439. (*Asperula flore carneo, acuto folio*; Barrel. Ic. t. 541.)—All the leaves whorled. Flowers terminal.—Native of cultivated or fallow fields, throughout Europe, from Sweden to Greece, flowering all summer long. The root is annual, fibrous, small. *Herb* generally hairy. *Stems* several, branched, leafy, angular, spreading in every direction, from three to five inches long; most slender at the base. *Leaves* spreading, mostly six in each whorl, elliptical or obovate, pointed, entire, roughest at the edges and keel. *Flowers* from four to six or eight, in a little ter-

minial umbel, enveloped in the uppermost whorl, which consists of more leaves than the rest. *Calyx* of two three-cleft acute leaves, afterwards enlarged, and forming a crest, or crown, to each seed. *Corolla* purplish-blue, with a slender tube, much exceeding the calyx.

2. *S. muralis*. Wall Sherardia. Linn. Sp. Pl. 149. Willd. n. 2. Sm. Fl. Græc. Sibth. v. 2. 13. t. 115. (*Galium murale*; Allion. Pedem. v. 1. 8. t. 77. f. 1. *G. minimum, feminibus oblongis*; Buxb. Cent. 31. t. 30. f. 2.)—Stems diffuse. Leaves four in a whorl, or in pairs, spreading. Whorls two-flowered. Stalks of the fruit reflexed.—Native of old walls, and rocks, in Italy and the Levant. Found in Crete by Dr. Sibthorp. Annual, about the size of the former, decumbent, and rough, but the leaves are smaller, sometimes six, sometimes but two, usually four, in a whorl. *Flowers* axillary, opposite, minute, shorter than the leaves, stalked. *Corolla* yellow, with a short tube. *Fruit* reflexed, of two hispid, oblong seeds, starting from each other in the middle, meeting at top and bottom, their crown, or *calyx*, hardly discoverable.

3. *S. erecta*. Upright Sherardia. Sm. Fl. Græc. Sibth. v. 2. 14. t. 116. (*Asperula muralis verticillata minima*; Column. Ecphr. 302. t. 300. *A. verticillata luteola*; Bauh. Pin. 334.)—Stems erect. Leaves four in a whorl, or in pairs, deflexed. Whorls many-flowered. Fruit nearly erect. Native of rocks and walls, in Italy and the Archipelago. Annual, erect, and more slender than the last, a span high. The shorter deflexed leaves, numerous flowers, and erect fruit, distinguish this species clearly, though Linnæus confounded its synonyms with his *muralis*. The crown of the seeds is equally obscure in both, and the habit of the plants answers better to that of the genuine *Valantia*, though the fructification differs. They but ill agree with *Sherardia*; yet their fruit will not allow them to be referred to *Galium*.

4. *S. frutescens*. Shrubby Sherardia. Linn. Sp. Pl. 149. Willd. n. 3. Swartz. Obf. 46.—Leaves four in a whorl, linear-lanceolate, revolute. Stem shrubby.—Gathered by Obeck in the island of Ascension. The stem is woody, branched, leafy, straggling or prostrate, and the whole plant has the aspect of *Ernodea montana* (see ERNODEA); but is distinct. Leaves an inch long, rather downy. *Calyx* of only four teeth. *Corolla* white, as long as the germen. Swartz justly observes, that this species but ill accords with *Sherardia*, being intermediate, as it were, between *Diodia* and *Spermacoce*.

SHERARDIA is also a name given by Pontedera to the genus of plants, called by Linnæus *galenia*.

SHERARIB, in *Geography*, a town of Africa, in Bergoo; 115 miles S.W. of Wara.

SHERAVEND, a town of Persia, in the province of Ghilan, on the Caspian sea; 20 miles S. of Aitara.

SHERBET, or SHERBIT, a compound drink, first brought into England from Turkey and Persia, consisting of fair water, lemon-juice, sugar, amber, and other ingredients.

Another kind of it is made of violets, honey, juice of raisins, &c.

The word *sherbet*, in the Persian language, signifies *pleasant liquor*.

SHERBORNE, or SHERBOURNE, anciently called *Sareburn*, in *Geography*, a market-town and parish in the hundred of that name, county of Dorset, England, is situated in the vale of Blakemore, near the borders of Somersetshire, at the distance of 16 miles W. from Shaftesbury, 18 N. by W. from Dorchester, and 117 W.S.W. from

SHERBORNE.

From London. It is a town of very high antiquity, but its origin is not precisely ascertained. Baxter contends that it was the Arianus, or Aranus of Ravennas, deriving its name from "Arian Uife, Argenteus Fluxus Aquæ," or "Fons Clarus." This opinion, however, is rendered extremely doubtful, by the total absence of all those appearances which almost invariably characterize the sites of British or Roman towns. It seems, therefore, more probable that it had its commencement in Saxon times, and germinated from a religious house, founded here soon after the conversion of the Saxons to Christianity. This monastery was richly endowed by several of the kings of Wessex, particularly by Cenwalch, and the great Alfred. After the Conquest, it was raised to the rank of an abbey, and the abbots were esteemed spiritual barons, and in consequence were frequently summoned to assist in the parliament or great council of the nation. At the dissolution, its revenues were rated, according to Speed and Dugdale, at 612*l.* 14*s.* 7*d.* *per annum.*

Sherborne was further distinguished, in ancient times, as the seat of an episcopal see, having been constituted such by king Ina, on the division of the bishopric of Winchester, A.D. 704. The first bishop of this diocese was Aldhelm, nephew to Ina, who is reported to have been a man of extraordinary talents, and a great benefactor to the see. His successors have been differently named by different writers, so that much uncertainty prevails respecting them. The most probable view of the subject, however, is, that they were twenty-five in number, and conjointly presided a period of 366 years. The most celebrated among them was Asler Menevensis, who wrote the life of Alfred the Great, and assisted him in his literary pursuits. In his time the see of Sherborne comprehended the counties of Dorset, Bucks, Wilts, Somerset, Devon, and Cornwall; but in 904, shortly after his death, the three latter counties were separated from it, and united to other bishoprics, by a bull of pope Sergius III. Herman, the 26th bishop, attempted to remove the seat of the bishopric to Malmesbury, but his intentions were thwarted by Godwin, earl of Kent, and the monks of that abbey. He succeeded, however, in effecting its removal some years afterwards, *viz.* in 1075, to Old Sarum, in consequence of the edict of the council at London, which directed that all bishops' sees should be transferred from obscure places to the most important town in each diocese. See SALISBURY.

From the great eagerness of Herman to quit Sherborne, it might reasonably be inferred that it was become a town of much less extent and importance than it was under his predecessors. Accordingly such is the fact, and the circumstance is easily accounted for; it being stated by historians, that it was laid in ashes by the Danes, under king Sweyn, during one of his vindictive excursions through this part of the kingdom. Besides, both Matthew of Westminster and William of Malmesbury describe it "as a small street, in which was nothing agreeable in number of inhabitants, or pleasantness of situation; and that it was matter of reproach and wonder that an episcopal seat had continued there so long." In this situation it appears to have remained for several centuries; but in the time of Leland it had recovered itself very considerably, as we find Sherborne mentioned in his Itinerary as the most frequented town in the county, and that in which the woollen trade was turned to the best account. After his time, however, this branch of business very much decreased; and the manufacture of buttons, haberdashery wares, and bone-lace, introduced in its stead. These trades have also decreased, and

now the silk and linen manufactures constitute the principal employment of the inhabitants.

Sherborne, though neither a borough by charter nor prescription, on one occasion sent members to parliament, in the reign of Edward III. At that time the assizes were regularly held here; but since the reign of his successor, that practice has only been occasional, as in cases of epidemical disorders, or otherwise. The general quarter sessions for the peace, however, are still held here once a year, on Tuesday after the close of Easter. The market-day here is Saturday, weekly; and there are fairs annually on Wednesday before Holy Thursday, 16th and 18th July, and the first Monday after 10th October.

The church of Sherborne, which is the only public building within the town of any importance, is a large and magnificent structure. It is built in the form of a cross, and entirely of free-stone. The original edifice was the work of bishop Aldhelm. But no part of that building probably now remains, as it has undergone frequent alterations, and in the time of king Henry VI. was almost wholly rebuilt. Hence, though displaying various styles of architecture, the greater part of it is in the pointed style of that age. The most material exceptions to this remark are the pillars supporting the tower, the south porch, and the chapel of our Lady, all of which are of early Norman origin, and the large lancet window at the eastern end of the chapel north of the chancel, which, with some smaller fragments in other parts, seem to be of the same date with Salisbury cathedral, *viz.* about the year 1220. All the later parts of the church are richly ornamented with tracery work, vine leaves, and flowers. The piers between the windows on each side are supported by light flying buttresses stretching over the side aisles. The roof is of stone, and supported by numerous groins springing from the side aisles; and between the tracery work is a number of shields bearing different arms, with roses, portcullises, and cut devices. This church was made parochial after the dissolution of the abbey, to which it previously belonged. It contains the ashes of many persons of distinction, and among others those of Ethelbold, king of Wessex, and his brother Ethelbert. The only modern monuments of note are those of John, earl of Bristol, who died in 1698, and of a son and daughter of William, lord Digby. On the latter are inscribed the following beautiful lines by Pope.

"Go, fair example of untainted youth,
Of modest reason, and pacific truth;
Composed in suffering, and in joy sedate,
Good without noise, without pretension great.
Go, just of word, in every thought sincere,
Who knew no wish but what the world might hear.
Of gentlest manners, unaffected mind;
Lover of peace, and friend of human-kind.
Go, live, for heaven's eternal year is thine;
Go, and exalt thy mortal to divine.
And thou, too close attendant on his doom,
Blest maid, has hastened to the silent tomb,
Steer'd the same course to the same quiet shore;
Not parted long, and now to part no more:
Go, then, where only bliss sincere is known,
Go, where to love and to enjoy is one.
Yet take these tears, mortality's relief,
And, till we share your joys, forgive our grief.
These little rites, a stone and verse, receive;
'Tis all a father, all a friend can give."

These lines, as printed in the different editions of Pope's works, vary very materially from the original.

Besides

Besides the established church, there were formerly in Sherborne two meeting-houses for dissenters; but at present there is only one, situated in Long-street. The other public structures here are the market-house, the work-house, an alms-house, and a free grammar-school. The alms-house was formerly a religious hospital dedicated to St. Augustine, and has a chapel attached to it, which appears to have been erected in the fifteenth century, and contains a very curious ancient painting upon oak in high preservation. This picture consists of three pieces, representing three of our Saviour's most remarkable miracles, and is characterized by Mr. Hutchins, in his History of Dorsetshire, as "very beautiful, and evidently executed by a masterly hand." The free grammar-school was founded and endowed by king Edward VI., and the government of it vested, by charter, in twenty principal inhabitants of Sherborne. At present, there are two masters attached to this school, who must be clergymen, and graduates of one or other of the universities. The buildings occupy the site of part of the ancient abbey, some considerable portions of which are still standing. The plan of education adopted here is similar to that of Eton. There are likewise in Sherborne two charity-schools on a contracted scale, three benefit societies, two for men, and one for women; and an institution of rather an uncommon kind, called the Green Girls' Society, which, from its excellent tendency, deserves to be more generally adopted. It was established in 1771. The members pay into it a small sum weekly, and wear, till they arrive at a certain age, green gowns and straw hats. When a girl attains the age of eighteen, she is at liberty to leave it, and if married before she is twenty-five, is entitled to 12*l.* on her wedding-day, and 1*l.* on the birth of her first child. If unmarried till twenty-five, she is then entitled to the first sum, provided she has lived a sober and virtuous life, otherwise her claims are forfeited to the society. The founder of this institution was the late Mr. John Toogood.

The parish of Sherborne extends about three miles and a half in length, and two miles and a half in breadth, and contains, according to the population census of 1811, 597 houses, and 3370 inhabitants, of whom above 2000 reside in the town. The late eminent Dr. Joseph Towers is generally stated to have been born at Sherborne, but we know from authority that he was not even a native of the county.

In a hamlet, or suburb called Cattleton, about half a mile eastward from the town, stood the ancient castle of Sherborne. This fortress was built by Roger, third bishop of Salisbury, and occupied a rocky eminence on the north bank of the river Ise. The area contained within the deep fosse, which inclosed the whole works, measured about four acres in extent. Few castles surpassed this in strength and magnificence of structure. It was one of the three, erected by the same bishop, which William of Malmesbury mentions among the wonders of the world. It was of an octagonal form, and had seven courts, with strong battlements surrounding it, and was built after the plan of a spider's web. It had also a tower at each angle, there being sixteen in all without the citadel, and appears to have been in every respect admirably calculated for security and defence; for if any one of the courts were scaled or taken, the soldiers in the gallery above would so annoy the assailants with their arrows and other missile weapons, as to render it impossible for them to retain possession of it. But notwithstanding the strength and importance of this castle, it does not appear to have been the scene of any events of interest in the history of the kingdom, till the reign of Charles I., when it was one of the first besieged by the parliament, and one of the last which abandoned the cause of the king. Since that time it has been gradually

falling into ruin, so that only a few fragments of it now remain.

The manor of Sherborne was very early granted to the see, and continued attached to it, during its successive removals, till the reign of king Henry VIII., who compelled bishop Piers to alienate it to the crown. Queen Elizabeth granted it to sir Walter Raleigh, on whose unjust execution by king James I. it was seized and given to the favourite Carr, notwithstanding the intercession of various distinguished individuals to obtain it for the family of its great, though unfortunate possessor. It afterwards became the property of sir John Digby, whose descendants still continue to enjoy it. The History and Antiquities of the County of Dorset, by John Hutchins, M.A., 2d edition, corrected and improved by Richard Gough, esq. and John Bowyer Nichols, esq. vol. iv. fol. 1815.

SHERBURN, a market-town in a parish of the same name, partly within the liberty of St. Peter of York, and partly in the upper division of the wapentake of Barkston Ash, West Riding of Yorkshire, England, is situated at the distance of 14 miles S.W. from the city of York, and 181 miles W. by N. from London. The market is held on Friday weekly, but is little frequented, and there is only one annual fair, on the 25th of September. This place was formerly, however, much more important, and was distinguished by a palace belonging to the archbishops of York, of which not a vestige now remains. It is only at present, therefore, remarkable for a particular species of plum called the Winefour, which grows in the vicinity. Sherburn township, according to the parliamentary returns of 1811, contains 188 houses, and 958 inhabitants. Beauties of England and Wales, vol. xvi. by John Bigland, 1812.

SHERBURNE, EDWARD, in *Biography*, an ingenious writer, was born in London in 1618, and educated under Farnaby; after which he went abroad, but returned in 1641, and succeeded, on the death of his father, to the office of clerk of the ordnance. He was imprisoned for some time by the parliament, and, on his recovering his liberty, joined the king, whom he served with fidelity and great bravery, by which he suffered considerably in his estate. After the battle of Edgehill he went to Oxford, where he was created master of arts. At the restoration he recovered his situation under government, was knighted, and made commissary-general of the artillery. He died in 1702. He translated Seneca's tragedies, the Sphere of Marcus Manilius, and other works, into the English language, and was author of a volume of poems.

SHERBURNE, in *Geography*, a post-town of America, in Chenango county, New York; containing 1282 inhabitants.—Also, a town in the state of Massachusetts, and island of Nantucket. The island contains 6807 inhabitants. (See NANTUCKET).—Also, a town in Middlesex county, Massachusetts, containing 770 inhabitants; 18 miles S.W. of Boston.—Also, a town of Herkemer county, New York; containing, by the census in 1796, 483 inhabitants.—Also, a town of Rutland county, Vermont; containing 116 inhabitants.

SHEREBATOF, PRINCE, in *Biography*, a learned Russian nobleman, who published several works in his own language, the chief of which is "The History of Russia from the earliest Times," which is said to be well arranged, and faithfully drawn up. Mr. Coxe, in speaking of this writer, says, several persons have published collections of state-papers and other documents, but the honour of composing a complete history of Russia is probably reserved for prince Sherebatof; who, if we except Mr. Muller, has contributed

contributed more than any other person towards illustrating the Russian annals. This learned nobleman is editor of "A Journal of Peter the Great," in 2 vols. 4to., which he found in the archives, and published by order of the empress; of "The Russian History, by an ancient Annalist, from the Beginning of the Reign of Vladimir Monomacha in 1114 to 1472;" "The Life of Peter the Great," in the Russian language, first published at Venice, which the prince reprinted in 1774, and, according to his usual custom, enriched with many historical observations. Of his History, already referred to, our author says, "I have read the German translation of this performance, which appears to me a most valuable addition to the history of the North. The author has had access to the imperial archives; he draws his information from the most ancient and unquestionable sources, is particularly exact in quoting his authorities, and ranges the events in a chronological series with great perspicuity." *Coxe's Travels*, vol. iii.

SHERET, in *Geography*, a town of Asiatic Turkey, in the government of Trebisond; 30 miles S.W. of Trebisond.

SHEREZUR, or SHERZOUR, or *Scherezur*, a town of Curdistan, the capital of a government, and residence of a Turkish pacha; 150 miles N. of Bagdad. N. lat. 35° 46'. E. long. 44° 25'.

SHERIBON. See *CHERIBON*.

SHERIDAN, THOMAS, in *Biography*, was born probably about the year 1684, in the county of Cavan, where his parents lived in such a state of indigence, as not to be able to afford him the advantages of a liberal education; but being observed to give early indications of genius, he attracted the notice of a friend to his family, who sent him to the college of Dublin, and contributed towards his support, while he remained there. Afterwards he proceeded to a doctor's degree, and took orders, and set up a school in Dublin, which long maintained a very high degree of reputation, as well for the attention bestowed on the morals of the scholars, as for their proficiency in literature. He does not appear to have had any considerable preferment; but his intimacy with Swift procured for him, in 1725, a living in the south of Ireland, worth about 150*l. per annum*, which he went to take possession of; and, by an act of inadvertence, it is said, destroyed all his future expectations of rising in the church: for being at Cork on the 1st of August, the anniversary of the king's birth-day, he preached from the text "Sufficient for the day is the evil thereof." The report of the fact was spread abroad: he was struck out of the list of chaplains to the lord-lieutenant, and forbidden the castle. He afterwards changed his living for that of Dunboyne, which by the knavery of the farmers, and power of the gentlemen in the neighbourhood, fell in value to 80*l. per annum*. He willingly resigned it for the free-school of Cavan, where he might have lived well; but the air being moist, and as he thought unhealthy, and being disgusted with some of his parishioners, he sold the school for about 400*l.*; and having spent the money, he fell into ill health, and died September 10th, 1758, in the 55th year of his age. He is thus characterized by lord Corke: "Dr. Sheridan was a schoolmaster, and in many instances perfectly adapted to that station. He was deeply versed in the Greek and Roman languages, and in their customs and antiquities. He had that kind of good nature, which absence of mind, indolence of body, and carelessness of fortune, produce; and though not over-strict in his own conduct, yet he took care of the morals of his scholars, whom he sent to the university remarkably well grounded in all kinds of classical learning, and not ill instructed in the social duties of life. He was slovenly, indigent, and cheerful.

VOL. XXXII.

He knew books much better than men, but he knew the value of money least of all. In this situation, and with this disposition, Swift fastened upon him as upon a prey, with which he intended to regale himself, whenever his appetite should prompt him." Dr. Sheridan published a prose translation of *Perfius*, to which he added the best notes of former editors, together with some very judicious ones of his own. He also translated the *Philoctetes* of Sophocles.

SHERIDAN, THOMAS, son of the preceding, was born at Quilca, in the county of Cavan, in Ireland; and he had for his god-father dean Swift. The early part of his education he received from his father, who afterwards sent him to Westminster school, and at a time when he could very ill afford it. Here, upon examination, he attracted notice; and although a mere stranger, he was elected a king's scholar, on account of his merit. But their maintenance sometimes running short, the doctor was so poor that he could not add fourteen pounds, to enable his son to finish the year; which if he had been able to have done, he would have been removed to a higher class, and in another year would have been sent off to a fellowship at college. Being thus recalled to Dublin, he was sent to the university, where he obtained an exhibition, and in 1738 he took his degree of M.A. Having no interest in the church, nor the means of preparing himself for one of the liberal professions, he resolved to seek a support on the stage. He was received with great applause, and in a short time became manager of the Dublin theatre; in which capacity he successfully undertook the curbing of that licentiousness, which had long reigned with an almost unlimited empire behind the scenes, and the putting a stop to the liberties daily taken by the young men with the female actresses. During eight years Mr. Sheridan possessed this important office of manager of the Dublin theatre with all the success, both with respect to fame and fortune, that could well be expected, when an unfortunate circumstance led him to oppose the wishes of the public, which obliged him to withdraw from the management of the theatre, and even to quit the country. He continued in England till the year 1756, when he returned to Dublin, and was again received on the stage with the highest applause; but he did not continue long in that situation, being opposed and ruined by rival actors.

In 1757 he published a plan, in which he proposed to the Irish the establishment of an academy, for the accomplishment of youth in every qualification necessary for a gentleman. In the formation of this design he included oratory, as one of the essentials; and in order to give a stronger idea of the utility of that art, he opened his plan to the public in some orations, which were so well written, and so admirably delivered, as to give the highest proofs of the ability of the proposer, and his fitness for the office of superintendent of such an institution, for which post he had offered himself. Nevertheless, though the plan was, in a measure, carried into execution, Mr. Sheridan was excluded from any share in the conduct of it. He now came again to England, and delivered lectures on elocution and oratory in the theatres of Oxford and Cambridge, to very numerous audiences, and with the highest reputation. From thence he again came to London, where he was engaged as an actor and a lecturer. In 1778 he published "A pronouncing Dictionary of the English Language;" and after this he became a manager of the Drury-lane theatre, under his son, the present Mr. Sheridan, who was then one of the patentees. He died in August, 1788. His works are as follow: 1. "A Dictionary of the English Language." 2. "Lectures on the Art of Reading." 3. "British Education, or the Source of the Disorders of Great Britain." 4. "A Dissertation on the Causes of the Difficulties

which occur in learning the English Tongue." 5. "A Course of Lectures on Elocution." 6. "The Life of Swift," prefixed to an edition of his works, edited by Mr. Sheridan. 7. "Elements of English." His wife Frances, whose maiden name was Chamberlaine, was a very ingenious woman, and was author of a novel, entitled "Sidney Biddulph," a moral romance, entitled "Nourjahad," "The Discovery," a comedy; and another, entitled "The Dupe." She died at Blois, in 1767.

SHERIDAN, the late Mrs., was daughter of the excellent musician, Mr. Linley, so well known at Bath, by his professional merit as a master, by the beauty and talents of his family, and by his vocal compositions, particularly his Elegies. If this were a place to celebrate the beauty and fascinating manners of Mrs. Sheridan, we could dwell upon them as long as on her voice and musical talents; but to these we must confine ourselves. There was a brilliancy, a spirit, and a mellifluous sweetness in the tone of her voice, which instantly penetrated the hearts of her hearers, as much as her angelic looks delighted their eyes. Her shake was perfect, her intonation truth itself, and the agility of her throat equal to any difficulty and rapidity that was pleasing. But in Handel's pathetic songs, in Purcell's "Mad Bess," in the upper part of serious glees, or whatever vocal music had impassioned words to express, she was sure to make them felt by every hearer possessed of intelligence and sensibility.

She knew music so well, that she was sure to do justice to every kind of Italian composition, as much as a foreigner ever did to a language not her own; though the energy and accent given by the natives of Italy, particularly in recitative, is ever comparatively deficient in the best singers of all other countries; as nothing but a long residence, early in life, in a foreign country, can acquire the correct pronunciation of its music, any more than of its language. It was observed by Sacchini, who heard Miss Linley sing at Oxford for the last time, that if she had happened to have been born in Italy, she would have been as much superior to all Italian singers, as she was then to those of her own country.

SHERIF, in the *Egyptian Orders*, the relations of Mahomet, the same tribe of persons called emir by the Turks.

The word is Persian, and signifies *great* or *noble*; and these persons have the privilege of being exempt from appearing before any judge but their own head; and if any of the military orders are obliged to punish them for any misdemeanor, they first take off their green turban, in respect to their character; and the same is done even when they are punished by their own magistrate.

The sherif, sherriffe, or scherif of Mecca, is the title of the descendants of Mahomet by Hassan ibn Ali. Although this branch of the posterity of Mahomet has never attained to the dignities of caliph or imam, it appears to have always enjoyed the sovereignty over most of the cities in the Arabian province of Hedsjas. The family of Ali-Bunemi, being one branch of the descendants of Hassan ibn Ali, and consisting of at least 300 individuals, enjoys the sole right to the throne of Mecca. This family is likewise subdivided into two subordinate branches, of which sometimes the one, sometimes the other, has given sovereigns to Mecca and Medina, when these were separate states; but the Turkish sultan is indifferent about the order of succession in the family, rather wishing to favour the strongest, that he may weaken them all. As the order of succession is not absolutely fixed, and the sherriffes may all aspire alike to the sovereign power, this uncertainty of right, aided by the intrigues of the Turkish officers, occasion frequent revolu-

tions. The grand sherriffe is seldom able to maintain himself on the throne; and it still seldom happens, that his reign is not disturbed by the revolt of his nearest relations. The dominions of the sherriffe comprehend the cities of Mecca, Medina, Jambo, Taaif, Sadie, Ghunfude, Hali, and thirteen other less considerable, all situated in Hedsjas. As these dominions are neither extensive nor opulent, the revenue of their sovereign cannot be considerable. He finds a rich resource, however, in the imposts levied on pilgrims, and in the gratuities offered him by Mussulman monarchs. Every pilgrim pays a tax of from 10 to 100 crowns, in proportion to his ability. The Grand Mogul remits annually 60,000 rupees to the sherriffe, by an assignment on the government of Surat; but since the English have made themselves masters of this city, and the territory belonging to it, the nabob of Surat has no longer been able to pay the sum. The power of the sherriffe extends not to spiritual matters: these are entirely managed by the heads of the clergy of different sects, who are resident at Mecca. Rigid Mussulmans, such as the Turks, are not very favourable in their sentiments of the sherriffes, but suspect their orthodoxy, and look upon them as tacitly attached to the tolerant sect of the Zeidi. See SCHERIF.

SHERIFF, or SHIRE-REVE, an officer in each county of England, of very great antiquity; his name being derived from the two Saxon words *scire*, province or *shire*; or rather from *sciran*, to divide, and *gerefa*, grave, *reve*, or *prefect*; the sheriff being denominated from the first division of the kingdom into counties.

He is called in Latin *vice-comes*, as being the deputy of the earl or comes, to whom the custody of the shire is said to have been committed at the first division of this kingdom into counties: but the earls being afterwards unable, by reason of their high employments, and attendance on the king's person, to transact the business of the county, the labour was committed to the sheriff; who now performs all the king's business in the county; and though he be still called *vice-comes*, yet he is entirely independent of, and not subject to, the earl: the king, by his letters patent, committing *custodiam comitatus* to the sheriff.

Sheriffs were formerly chosen by the inhabitants of the several counties; in confirmation of which, it was ordained by 28 Edw. I. c. 8. that the people should have election of sheriffs in every shire, where the sheriffalty is not of inheritance; for anciently in some counties the sheriffs were hereditary, as judge Blackstone apprehends they were in Scotland, till the statute 20 Geo. II. c. 43. and still continue in the county of Westmoreland to this day: the city of London having also the inheritance of the sheriffalty of Middlesex vested in their body by charter. This election, says the same author, was, in all probability, not absolutely vested in the commons, but required the royal approbation. For in the Gothic constitution, the judges of their county-courts (which office is executed by our sheriff) were elected by the people, but confirmed by the king; and the form of their election was thus managed: the people, or *incole territorii*, chose twelve electors, and they nominated three persons, *ex quibus rex unum confirmabat*. But with us in England, these popular elections growing tumultuous, were put an end to by the statute 9 Edw. II. ft. 2. which enacted, that the sheriffs should from thenceforth be assigned by the chancellor, treasurer, and the judges, as being persons in whom the same trust might with confidence be reposed. By statutes 14 Edw. III. c. 7, 23 Hen. VI. c. 8, and 21 Hen. VIII. c. 20, the chancellor, treasurer, president of the king's council, chief justices, and chief baron, are to make this election on the morrow of All-Souls in the exchequer: and the king's letters patent, appointing the new sheriffs,

SHERIFF.

used commonly to bear date the sixth day of November. 12 Edw. IV. c. 1.

And the custom now is, which has obtained since the time of Henry VI. that all the judges, together with the other great officers, meet in the exchequer chamber on the morrow of All-Souls yearly (which day is now altered to the morrow of St. Martin, by the last act for abbreviating Michaelmas term), and then and there propose three persons to the king, who afterwards appoints one of them to be sheriff.

This custom of the twelve judges proposing three persons, seems borrowed from the Gothic constitution before-mentioned; with this difference, that among the Goths the twelve nominees were first elected by the people themselves: which usage of ours was probably founded upon some statute, though not now to be found among our printed laws. But notwithstanding an unanimous resolution of all the judges of England to this purpose, entered in the council-book of 3 March, 34 Hen. VI. and the statute 34 & 35 Hen. VIII. cap. 26. sect. 61. which expressly recognizes this to be the law of the land; some of our writers have affirmed, that the king, by his prerogative, may name whom he pleases to be sheriff, whether chosen by the judges or not. This is grounded on a very particular case in the fifth year of queen Elizabeth, when, by reason of the plague, there was no Michaelmas term kept at Westminster, so that the judges could not meet there in *crastino animarum*, to nominate the sheriffs; upon which the queen named them herself, without such previous assembly, appointing for the most part one of the two remaining in the last year's list. And this case, so circumstanced, is the only authority in our books for making these extraordinary sheriffs.

However, it must be acknowledged, that the practice of occasionally naming what are called pocket-sheriffs, by the sole authority of the crown, hath uniformly continued to the reign of his present majesty, George III. in which, says Blackstone, few, if any, instances have occurred.

By four several statutes it is enacted, that no one shall be sheriff, except he have sufficient land within the shire to answer the king and the people in any manner of complaint. 9 Edw. II. ft. 2. 4 Edw. III. c. 9. 5 Edw. III. c. 4. 13 & 14 Car. II. c. 21.

It has been judged, that an attorney is exempted from the office of sheriff, by reason of his attendance on the courts of Westminster.

By 2 Geo. III. c. 20. no person, during the time he is acting as a militia-officer, shall be obliged to serve the office of sheriff.

Protestant dissenters, who are exempted by the Toleration act from the obligation of complying with the requisition of the Corporation act, and who can plead their non-compliance as a reasonable and sufficient excuse, are not compellable to serve this office, nor of course to pay any fine for refusal. See Furneaux's Letters to Blackstone, ed. 2, and particularly the Appendix, containing lord Mansfield's speech in the house of lords 1767, on the cause between the city of London and the dissenters, when the house affirmed the unanimous judgment of the commissioners' delegates, who delivered their opinions *seriatim* on the 5th of July, 1762, after hearing counsel several days.

By a by-law of the city of London, passed in a common-council June 11th, 1799, amending an act of April the 7th, 1748, no freeman chosen sheriff, &c. shall be excused, unless he voluntarily swears he is not worth 20,000*l.* &c. which oath shall be attested by the oaths of six other freemen; and if he refuses to take the office, he incurs a forfeiture of 400*l.* and twenty marks towards the maintenance of the ministers of the several prisons within the city, together with the usual fines. If, however, he shall afterwards take upon

him the office of an alderman of the city, he shall be eligible to the said office of sheriffalty, notwithstanding the foregoing mentioned payment.

The sheriff, before he exercises any part of his office, and before his patent is made out, is to give security in the king's remembrancer's office in the exchequer, under penalty of 100*l.* for the payment of his proffers, and all other profits of the sheriffwick; he must also take the oaths of allegiance and abjuration, and all, except the sheriffs of Wales and Chester, an oath appointed by 3 Geo. I. cap. 15. sect. 18. for the due execution of their office. This oath may be administered in pursuance of a writ of *dedimus potestatem*.

Sheriffs, by virtue of several old statutes, are to continue in their office no longer than one year: and yet it hath been said, that a sheriff may be appointed *durante bene placito*, or during the king's pleasure, and so is the form of the royal writ; therefore, till a new sheriff be named, his office cannot be determined, unless by his own death, or the demise of the king.

And by 1 Ann. ft. 1. c. 8. all officers appointed by the preceding king may hold their offices for six months after the king's demise, unless sooner displaced by the successor.

We may farther observe, that by 1 Rich. II. c. 11. no man, that has served the office of sheriff for one year, can be compelled to serve the same again within three years after.

The power and duty of a sheriff are those that belong to him as a judge, as a keeper of the king's peace, as a ministerial officer of the superior courts of justice, or as the king's bailiff.

In his judicial capacity he is to hear and determine all causes of forty shillings value and under, in his county-court; and he has also a judicial power in divers other civil cases. He is likewise to decide the elections of knights of the shire (subject to the controul of the house of commons), of coroners, and of verderors; to judge of the qualification of voters; and to return such as he shall determine to be duly elected, but incapable of being elected himself for the county, &c. of which he is returning officer.

As the keeper of the king's peace, both by common law and special commission, he is the first man in the county, and superior in rank to any nobleman therein, during his office. He may apprehend and commit to prison all persons who break the peace, or attempt to break it; and may bind any one in a recognizance to keep the peace. He may, and is bound, *ex officio*, to pursue and take all traitors, murderers, felons, and other misdoers, and commit them to gaol for safe custody. He is also to defend his county against any of the king's enemies when they come into the land; and, for this purpose, as well as for keeping the peace and pursuing felons, he may raise the *posse comitatus*.

However, by the express directions of the great charter, the sheriff, together with the constable, coroner, and certain other officers of the king, are forbidden to hold any pleas of the crown, or, in other words, to try any criminal offence; for it would be highly unbecoming, that the executors of justice should be also the judges; should impose as well as levy fines and amercements; should one day condemn a man to death, and personally execute him the next.

Neither may he act as an ordinary justice of the peace during the time of his office, for this would be equally inconsistent, he being in many respects the servant of the justices.

In his ministerial capacity, the sheriff is bound to execute all process issuing from the king's courts of justice. In the commencement of civil causes, he is to serve the writ, to arrest, and to take bail: when the cause comes to trial, he

mult summon, and return the jury; when it is determined, he must see the judgment of the court carried into execution. In criminal matters, he also arrests and imprisons; he returns the jury; he has the custody of the delinquent; and he executes the sentence of the court, though it extend to death itself.

As the king's bailiff, it is the sheriff's business to preserve the rights of the king within his bailiwick; for so his county is frequently called in the writs. He must seize, to the king's use, all lands devolved to the crown by attainder or escheat; must levy all fines and forfeitures; must seize and keep all waifs, wrecks, estrays, and the like, unless they be granted to some subject; and must also collect the king's rents within his bailiwick, if commanded by process from the exchequer.

To execute these various offices, the sheriff has under him many inferior officers, an under-sheriff, bailiffs, and gaolers, who must neither buy, sell, nor farm their offices, on forfeiture of 500*l.* 3 Geo. I. c. 15.

The under-sheriff usually performs all the duties of office, few excepted, with regard to which the personal presence of the high sheriff is necessary. But no under-sheriff shall abide in his office above one year by 42 Edw. III. c. 9, and if he does, by 23 Hen. VI. c. 8. he forfeits 200*l.*; and no under-sheriff, or sheriff's officer, shall practise as an attorney during the time he continues in such office, by 1 Hen. V. c. 4. But these regulations are evaded, by practising in the names of other attorneys, and putting in them deputies by way of nominal under-sheriffs.

The under-sheriff, before he enters upon his office, is to be sworn, by 27 Eliz. c. 12. And by 3 Geo. I. c. 15. sect. 19. it is enacted, that all under-sheriffs of any counties in South Britain, except the counties in Wales, and the county palatine of Chester, shall take an oath for the due execution of their office. Blackst. Com. b. i.

SHERIFF'S COURT. See COUNTY COURT, and Mayor's COURTS.

SHERIFF'S Tourn, or Turn. See TURN.

SHERIFF, Apposal of. See APPOSAL.

SHERIFFS, Issues on. See ISSUES.

SHERIFF, in Commerce. See XERIFF.

SHERIL, in Geography, a town of Asiatic Turkey, in the province of Diarbekir, on the Euphrates; 20 miles E. of Anah.

SHERILLA, a town of Africa, in Kaarta. N. lat. 14° 29'. W. long. 6° 25'.

SHERLING, or SHIRLING Lambs, in Rural Economy, the practice of cutting or shearing the short woolly coats or coverings of these young animals in the summer season, about the time at which the old sheep are clipped. Both the term and the custom are common in the northern districts, though they are scarcely known in the more southern parts of the island. Probably the greatest part of the lambs which are brought to Smithfield market, as well as of those which are bought by the butchers of the metropolis, are never *shearled* or freed from their coats, by which a very great individual as well as national loss is sustained. Perhaps the lambs are more saleable when kept in their full coats. The practice is, however, worthy of being more attended to in all situations.

The clipping or shirling of the lambs in some districts has, however, been considered as injurious, by the operation's hurting the growth of them; though no such effect has been discovered to take place in the South Down sheep tract of the county of Sussex, or those of many other parts of the north. The profit in the above district is, however, thought to be trifling, or such as only to repay the expenses, and a little more; but it has a tendency to improve

the wool, and cause it to throw out a more luxuriant staple. See WOOL.

SHERLOCK, WILLIAM, in Biography, an eminent divine in the English church, was born in London in 1641. He was educated at Eton, and thence he went to Peter-House, Cambridge, where he applied himself with much assiduity to his studies, obtained a good reputation, took orders, and officiated as a curate till the year 1669, when he was presented to the rectory of St. George's, Botolph Lane, London. He stood high in character among the London clergy, when he published "A Discourse concerning the Knowledge of Christ, and our Communion with Him," being intended as a confutation of the Antinomian doctrine, which brought upon him several antagonists, against whom he vindicated himself with judgment and zeal. In 1680 he took the degree of D.D. and in the following year he obtained a prebend in the cathedral of St. Paul's. The discovery of what was called the Rye-house plot, having called forth the spirit of loyalty, Dr. Sherlock appeared as an assertor of the doctrine of non-resistance, in a work entitled "The Case of Resistance to the supreme Powers stated and resolved according to the Doctrines of the Holy Scriptures." In this piece he maintained that the authority of the sovereign was in his *person*, and not in the *law*:—that he does not receive his authority from the laws, but that the laws receive their power from him;—and that it does not become a man who can reason at all to talk of the authority of the laws in derogation to the authority of the sovereign power. From these slavish principles he did not in the least swerve, even after the accession of James II. had still more endangered the public liberties and religion of the country. His notion of passive obedience did not, however, prevent him from opposing Popery, for he was among the first who, in those times, engaged in controversy with the Papists, in which he wrote a great number of tracts.

After the revolution, Dr. Sherlock for some time remained firm in his high monarchical principles; and refusing to take the oaths to the new government, was suspended from all his preferments, among which was the mastership of the Temple. It was during this suspension from his labours as a preacher, that he published the treatise on "Death," to which he is chiefly indebted for celebrity as an author. It was entitled "A Practical Discourse concerning Death," and few works have been more popular among all classes. It went through thirty editions in a short space of time, has been printed in all sizes and forms, and has been applauded by the most able critics.

Not long after the publication of this work, Dr. Sherlock's scruples with respect to government gave way; he took the oaths, and was reinstated in all his preferments. This step of course exposed him to the censure of the party with whom he had long acted, and to vindicate himself he published a piece, entitled "The Case of the Allegiance due to sovereign Powers stated and resolved." In 1692 he published his "Vindication of the Doctrine of the Holy and Ever-blessed Trinity." In this he maintained that there were three eternal minds, which exposed him to the charge of tritheism; it did not, however, prevent his promotion to the deanery of St. Paul's, on the recommendation of Dr. Tillotson, who was raised to the archbishopric of Canterbury.

This rise in the church exasperated still more those who were already indisposed against him for his desertion of his former principles, and Dr. South published in 1693, "Animadversions upon Dr. Sherlock's Book, &c." An eager controversy followed, in which the university of Oxford took part, by censuring in a public decree the hypothesis of Dr. Sherlock, as maintained by a preacher at that place. The contest being carried on with great acrimony, the king, at

the desire of the bishops, interposed with a prohibition of the use of new terms in the explication of the doctrine of the Trinity.

In 1704 Dr. Sherlock published "A Discourse on the Immortality of the Soul," in which he made an attack on Locke's opinion concerning innate ideas. He died in 1707, in the 67th year of his age. After his decease, his sermons, which had been printed during his life, were collected, and with others printed in two volumes, 8vo.

SHERLOCK, THOMAS, a distinguished prelate, and son of the preceding, was born in London in 1678. He received his classical education at Eton, and from thence he removed to Catharine-hall, Cambridge, about the year 1693. In process of time he became a fellow of that society, entered into holy orders, and upon the resignation of his father in 1704, he succeeded to the office of master of the Temple. In the duties of this office he exerted himself with so much success, that few English divines have acquired so high a reputation for pulpit oratory, in the qualities of strength and solidity of reasoning, and forcible and manly eloquence.

He commenced doctor of divinity in 1707, and in 1714 was elected master of Catharine-hall. Being promoted to the deanery of Chichester in 1726, he soon after made his first appearance in print, as a champion of the establishment, in "A Vindication of the Corporation and Test Acts, in answer to the Bishop of Bangor's Reasons for the Repeal of them." This was replied to by the worthy prelate, and supported in a rejoinder by the dean.

Dr. Sherlock's next work was entitled "The Use and Intent of Prophecy in the several Ages of the World," which was the substance of some sermons preached in the Temple church, occasioned by the controversy between Collins and several divines on the subject of prophecy. In 1728 he was promoted to the see of Bangor, in which he succeeded his antagonist Hoadly, as he did, in 1738, in that of Salisbury. As a member of the upper house, he took an active part in its debates, and was always a supporter of the interests of the crown and the church. He was considered, in parliament, as a great authority in ecclesiastical law, and frequently led the judgment of the house; and such at length was the reputation which he had in the episcopal character, that upon the death of archbishop Potter, in 1747, he was offered to succeed him in the see of Canterbury, which he declined on account of ill health, but afterwards recovering, he accepted the see of London in 1749. In 1753 he resigned the mastership of the Temple, and was very soon after incapacitated for any very active service: he nearly lost the use of his limbs and speech, but still retained the vigour of his understanding, and was capable of revising and correcting a volume of sermons: this was followed by four others, which are in high estimation. The bishop died in 1761, in the 84th year of his age.

SHERMA, or CHERMA, in *Geography*, a province of the kingdom of Morocco, which lies between the province of Hea and that of Morocco, and has been dismembered from that of Hea. See SHEDMA.

SHERMAN, a town of America, in the state of Connecticut and county of Fairfield, containing 949 inhabitants.

SHERMANSLI, a town of Asiatic Turkey, in Nattolia; 48 miles W. of Burfa.

SHERONA, a town of Egypt, on the right bank of the Nile; 8 miles N. of Abu Girgé.

SHERRINGHAM, in *Biography*, a composer of songs in parts during the reign of Henry VII. which have been preserved with those of other contemporary composers in the Fairfax MS. the most ancient book of the kind that we have ever been able to discover. See FAIRFAX.

SHERSHELL, in *Geography*, a town of Africa, in the kingdom of Algiers, generally supposed to be the city called *Jol*, and by the younger Juba named *Cesarea*, in compliment to Augustus. This town, when Dr. Shaw saw it, in the year 1730, was in great reputation for making steel, earthen vessels, and such iron tools as are wanted in the neighbourhood: but a few years afterwards (1738) it was entirely thrown down by an earthquake. The ruins upon which this town was situated, are not inferior in extent to those of Carthage; and we may likewise conceive no small opinion of its former magnificence, from the fine pillars, capitals, spacious cisterns, and beautiful mosaic pavements, that are every where remaining. They have a tradition, that the ancient city was destroyed, as the new one was lately, by an earthquake; and that the port, formerly very large and commodious, was destroyed by the arsenal and other adjacent buildings being thrown into it by the shock. The cothon, or artificial harbour, that had a communication with the western part of the port, is the best proof of this tradition: for when the sea is calm, and the water low, (as frequently happens after strong south or east winds,) all over the area of it so many masonry pillars and pieces of great walls may be seen, that it cannot well be conceived how they should come there without such a concussion. The port is nearly of a circular form, of 200 yards in diameter; but the securest part of it, which, till of late was towards the cothon, is now filled up with a bank of sand, that daily increases. However, there still lies in the mouth of it a small rocky island, which at present is the main shelter and defence against the northern tempest. N. lat. $36^{\circ} 35'$. E. long. $2^{\circ} 30'$.

SHERVEND, a town of Persia, in the province of Irak; 32 miles N. of Confar.

SHERWOOD FOREST. See SHIREWOOD Forest.

SHERZOUR. See SHEREZUR.

SHESBEQUIN, a post-town of America, in Luzerne county, Pennsylvania; 80 miles N.N.W. of Philadelphia.

SHESHME-BAND, a town of Persia, in the province of Segestan; 50 miles W.S.W. of Ferah.

SHESHMESA, a town of Persia, in the province of Khorasan; 35 miles W. of Tabas-Kileki.

SHETABAVA, a town of Hindoostan, in the Carnatic; 40 miles S. of Tanjore.

SHETERU, a town of Hindoostan, in Coimbatore; 5 miles N.W. of Erroad.

SHETLAND ISLANDS. See ZETLAND Islands.

SHETLAND-Sheep, in *Agriculture*, a breed of fine-woolled sheep peculiar to the Shetland islands. See SHEEP.

SHETUCKET, in *Geography*, a river of America, in Connecticut, formed by the junction of Willomantic and Mount Hope rivers, which after running E. a few miles pursues a southern course, and uniting with Quinnabang river discharges itself into the Thames in the southern part of the township of Norwich.

SHEVADY, a town of Hindoostan; 8 miles W.N.W. of Pullunare.

SHEVAGUNGA, a town of Hindoostan, in Mysoor; 25 miles N.W. of Bangalore. N. lat. $13^{\circ} 6'$. E. long. $77^{\circ} 13'$.

SHEVAGURY, a town of Hindoostan, in Madura; 15 miles N.W. of Coilpetta.

SHEVALORE, a town of Hindoostan, in Marawar; 8 miles N.W. of Trumian.

SHEVALPETTORE, a town of Hindoostan, in Marawar; 32 miles N.N.W. of Ramanadporum.—Also, a town of Hindoostan, in the province of Madura; 35 miles S.S.W. of Madura.

SHEVA-

SHEVAPORUM, a town of Hindoostan, in the country of the Nays; 15 miles E. of Tellicherry.

SHEVGUNGA, a town of Hindoostan, in Marawar; 20 miles S. of Tripattore.

SHEVITON INDIANS, Indians of North America. N. lat. $47^{\circ} 30'$. W. long. $104^{\circ} 45'$.

SHEW-Box for Prints. See **CAMERA**.

SHEWAGE. See **SCAVERAGE**.

SHEW-BREAD, in the *Jewish Economy*. The Hebrew (Exod. xxv. 30.) **לֶחֶם פָּנִים**, *lechem panim*, signifies literally "bread of faces, or of the faces." This denomination was given to the loaves of bread, which the priest of the week placed every Sabbath-day on the golden table in the sanctuary, before the Lord. These loaves were of a square form, with four faces, as the rabbins say, and were twelve in number, representing the twelve tribes of Israel. They supplied the place of those which had been exposed the whole week, and none could lawfully eat them but the priests. This offering was accompanied with frankincense and salt. Of the first fruits and tenths presented by the Israelites to the priests, the latter took that which was necessary for making the shew-bread, and for supplying the service of the temple with any thing else which it was their duty to furnish.

SHEWIN, or **SEWIN**, in *Ichthyology*. See **GREY**.

SHIGATCHEE, in *Geography*. See **SGIGATCHEE**.

SHIAB, a town of Arabia, in the province of Hedjas; 84 miles S.E. of Calaat al Moilah.

SHIANDAMANGALY, a town of Hindoostan, in the province of Tinevelly; 10 miles S. of Tutacorin.

SHIANSHIA, a town of Egypt; 25 miles S. of Manfora.

SHIANT ISLANDS. See **SHAINT**.

SHIBBOLETH, or **SIBBOLETH**, a Hebrew word which signified spica, or an ear of corn. It was used by way of distinguishing the Ephraimites from the men of Gilead. For the latter having killed a great number of the former, set guards at all the passes of Jordan; and when an Ephraimite, who had escaped, came to the water-side, and desired to pass over, they asked him if he was not an Ephraimite? If he said no, they bade him pronounce Shibboleth. But he pronouncing it Sibboleth, according to the manner of the Ephraimites, and thus not enunciating the first letter, was killed on the spot: on this occasion, 42,000 Ephraimites were killed. By thus not distinguishing between the *sh* and the *s*, the schin and the sin, they exposed themselves to this massacre: hence the terms have been used to denote the trivial grounds on which contending parties, particularly in theological disputes, often differ, and proceed to think ill of, and actually to persecute, one another.

SHIBKAH, in *Geography*, an extensive salt-plain of Algiers, overflowed in winter, but dry in summer; 10 miles S. of Oran.

SHICARAN, a town of Asiatic Turkey, in the province of Diarbeckir; 18 miles W.S.W. of Hazou.

SHIDES. See **SHINGLES**.

SHIEL, **LOCH**, in *Geography*, a lake in the parish of Ardnurchan, and county of Inverness, Scotland; extending ten miles in length, and two in breadth. Near its centre rises an islet, called Island Finan, which contains the ruins of a chapel dedicated to the saint of that name. This lake discharges its waters into the Western ocean at Castle Tioram, by the river Shiel. Statistical Account of Scotland, by Sir John Sinclair, vol. ii. 1792.

SHIELD, an ancient weapon of defence, in form of a light buckler, borne on the arm to fend off lances, darts, &c.

The form of the shield is represented by the escutcheon in coats of arms.

The shield was that part of the ancient armour on which the persons of distinction in the field of battle always had their arms painted; and most of the words used at this time to express the space that holds the arms of families, are derived from the Latin name for a shield, *scutum*. The French *escu*, and *escusson*, and the English word, *escutcheon*, or, as we commonly speak it, *scutcheon*, is evidently from this origin; and the Italian *scudo* signifies both the shield of arms, and that used in war.

The Latin name *clypeus*, for the same thing, seems also to be derived from the Greek word *κλυπεω*, *to engrave*; and it had this name from the several figures engraved on it, as marks of distinction of the person who wore it.

The shield in war, among the Greeks and Romans, was not only useful in the defence of the body, but it was also a token or badge of honour to the wearer, and he who returned from battle without it, was always treated with infamy afterwards.

People have at all times thought this honourable piece of the armour the properest place to engrave or figure on the signs of dignity of the possessor of it; and hence, when arms came to be painted for families in after-times, the heralds always chose to represent them upon the figure of a shield, but with several exterior additions and ornaments, as the helmet, supporters, and the rest.

The form of the shield has not only been found different in various nations, but even the people of the same nation, at different times, have varied its form extremely; and among several people there have been shields of several forms and sizes in use, at the same period of time, and suited to different occasions.

The most ancient and universal form of shields, in the earlier ages, seems to have been the triangular, vulgarly called the heater shield, from its resemblance to that instrument of housewifery. This we see instances of in all the monuments and gems of antiquity: our own most early monuments shew it to have been the most antique shape also with us, and the heralds have found it the most convenient for their purposes, when they had any odd number of figures to represent; as if three, then two in the broad bottom part, and one in the narrow upper end, it held them very well; or if five, they stood as conveniently, as three below, and two above. Most of the monumental figures of cross-legged knights are armed with triangular shields, which are generally a little convex, or curved in their breadth; their upper extremity terminated by a line parallel to the horizon, and their sides formed by the intersection of the segments of two circles. Such are generally represented on ancient seals and windows: sometimes, though not often, their surfaces are flat. On the inside of the Norman shields were two or more loops of leather, or wooden handles, through which the arm and hand were passed, when the shield was braced, and prepared for use; at other times it was carried by a leathern thong worn round the neck. The other form of a shield, now universally used, is square, rounded, and pointed at the bottom: this is taken from the figure of the Samnitic shield used by the Romans, and since copied very generally by the English, French, and Germans. See **TARGET**.

The shield, though it was not entirely relinquished so long as the use of the long and cross bows continued, seems to have undergone some alteration in its form; the triangular, or heater shield, gradually giving place to those of a circular or rectangular figure. Shields were first left off by the cavalry; they were, however, used in the army of king Edward I., at the siege of Karlaverok, in the year 1300.

A fort

A sort of shields was worn by the Scots at the battle of Muffelborough, in the first year of Edward VI. Shields or bucklers seem to have been used in affrays and private quarrels, by persons in the civil line, as late as the reigns of Elizabeth and king James I. The common appellation for a quarrellsome or fighting fellow about that period was a *swash-buckler*, that is, a breaker or clasher of bucklers. Maurice, prince of Orange, was a great advocate for the shield, and even attempted to revive the use of it. His company of Dutch guards was armed with targets and roundels, and he formed a regular plan of exercise for them. The target and broad sword were the favourite arms of the Scotch Highlanders as late as the year 1746, and even after. Swords and bucklers were anciently borne before great military officers, as insignia of their dignity: those carried before king Edward III. in France, are shewn in Westminster Abbey. The shield borne before the commandant of the forces on board the Spanish Armada, is preserved in the Tower, and a sword was borne before the bishop of Norwich, as commander of the troops with which he intended to serve king Richard II. Most of the ornamented metal shields, and many of the very large swords, were designed for this use.

The Spaniards and Portuguese have the like general form of shields, but they are round at the bottom, without the point; and the Germans, beside the Samnite shield, have two others pretty much in use: these are, 1. The bulging shield, distinguished by its swelling or bulging out at the flanks; and, 2. The indented shield, or shield *chancree*, which has a number of notches and indentings all round its sides. The use of the ancient shield of this form was, that the notches served to rest the lance upon, that it might be firm while it gave the thrust; but this form being less proper for the receiving armorial figures, the two former have been much more used in the heraldry of that nation.

Another form of shield derived its name *roundel*, or *rondacha*, from its circular figure; it was made of officers, boards of light wood, sinews or ropes, covered with leather, plates of metal, or stuck full of nails, in concentric circles, or other figures. The shields and roundels of metal, particularly those richly engraved or embossed, seem rather to have been insignia of dignity, anciently borne before generals or great officers, than calculated for war; most of them being either too heavy for convenient use, or too slight to resist the violence of a stroke either from a sword or battle-axe. Although most roundels are convex, we meet with many that are concave; but these have commonly an *umbo*. The handles are placed as in the shield and target. The roundel seems, in many instances, to resemble the Roman *parma*. For another form of shield, see *PAVAIS*.

Besides this different form of the shields in heraldry, we find them also often distinguished by their different positions, some of them standing erect, and others standing various ways, and in different degrees; this the heralds express by the word *pendant*, *hanging*, they seeming to be hung up, not by the centre, but by the right or left corner. The French call these *ecu pendant*, and the common antique triangular ones *ecu ancien*. The Italians call this *scuto pendente*; and the reason given for exhibiting the shield in these figures in heraldry is, that in the ancient tilts and tournaments, they who were to fight at these military exercises, were obliged to hang up their shields, with their armories or coats of arms on them, out at the windows and balconies of the houses near the place; or upon trees, pavilions, or the barriers of the ground, if the exercise was to be performed in the field. Those who were to fight on foot, according to Columbiere, had their shields hung up by the right corner, and those who were to fight on horse-back, had theirs hung up by the left.

This position of the shields in heraldry is called *couche* by some writers, though by the generality *pendant*.

It was very frequent in all parts of Europe, in arms given between the eleventh and fourteenth centuries; but it is to be observed, that the hanging by the left corner, as it was the token of the owner's being to fight on horse-back, so it was esteemed the most honourable and noble situation; and all the pendant shields of the sons of the royal family of Scotland and England, and of our nobility, at that time, are thus hanging from the left corner. The hanging from this corner was a token of the owner's being of noble birth, and having fought in the tournaments before; but no sovereign ever had a shield pendant any way, but always erect, as they never formally entered the lists of the tournament.

The Italians generally have their shields of arms of an oval form; this seems to be done in imitation of those of the popes, and other dignified clergy; but their herald, Petro Sancto, seems to regret the use of this figure of the shield, as an innovation brought in by the painters and engravers, as most convenient for holding the figures, but derogatory to the honour of the possessor, as not representing either antiquity, or honours won in war, but rather the honours of some citizen, or person of learning. Some have carried it so far, as to say that those, who either have no ancient title to nobility, or have sullied it by any unworthy action, cannot any longer wear their arms in shields properly figured, but were obliged to have them painted in an oval or round shield.

In Flanders, where this author lived, the round and oval shields are in the disrepute he speaks of; but in Italy, besides the popes and dignified prelates, many of the first families of the laity have them.

The secular princes, in many other countries, also retain this form of the shield, as the most ancient, and truly expressive of the Roman clypeus. Nisbet's Heraldry, p. 12. Comptonille, Herald.

SHIELD, in *Heraldry*, denotes the escutcheon, or field wherein the bearings of the armoury are placed. See **ESCUTCHEON**.

SHIELDRAKE. See **TADORNA**.

SHIELDS, **WILLIAM**, in *Biography*. Though this musical professor, for the happiness of his acquaintance, still ranks with the living, and we can tell our contemporaries nothing concerning his worth and talents which is not already well known, yet as his name has penetrated into Germany, and has furnished an article in Gerber's Continuation of Walther's Musical Lexicon, we cannot resist confirming the account given of his compositions in that work.

SHIELDS, *North*, in *Geography*, a market-town and sea-port in Castle ward, county of Northumberland, England, is situated near the entrance of the river Tyne, on its northern bank, at the distance of half a mile W.S.W. from the town of Tynemouth, and 279 miles N. by W. from London. This town is indebted for its origin to the monks of Tynemouth priory, who erected a number of houses here, and encouraged the settlement of ship-owners and tradesmen, early in the reign of Edward I. They at the same time formed a harbour here for lading and unlading of ships, and established a weekly market and fairs; but the exercise of these privileges having been disputed by the corporation of Newcastle, they were inhibited by a decret of the itinerant judges. From that period it continued to be a mere fishing village till the middle of the seventeenth century, when new efforts were made to render it an important sea-port, for which purpose its situation is admirably adapted. Cromwell, who then held the reins of government, with the consent of parliament

SHIELDS.

parliament passed an act, in which it was ordered, "that sufficient and well-fenced ballast-shores, quays, and fleets, be built at Shields," and "that North Shields be made a market-town two days in the week, for the relief of the country and garrison of Tynemouth, and for all the great confluence of people and fleets of ships."

In consequence of this act, North Shields would soon have become a place of great commercial importance; but on the restoration, the rights claimed by the corporation of Newcastle were resumed; and North Shields was deprived of its markets and fair. From that time every mean which a narrow and illiberal policy could devise, was employed to retard the growing prosperity of this port; but towards the conclusion of last century, many of the unjust restrictions which formerly subsisted were removed, and the different trades permitted to be followed without molestation. It was only, however, in the year 1804, that North Shields obtained the privilege of holding a weekly market and fairs, by petition of the inhabitants to the duke of Northumberland, as lord of the manor of Tynemouth, in which the site of North Shields is included. The day of the first opening of the market was ushered in with great rejoicings, and at noon a salute of cannon announced the completion of the long wished-for event. The market-day is Friday, and the fairs are held on the last Friday in April, and the first Friday in November.

North Shields, from these circumstances, and the patriotic exertions of the duke of Northumberland, is become, in the course of a few years, a large and populous town. It contains many handsome streets, and two elegant squares, besides the market-place, lately formed, which may rival any provincial market-place in the kingdom. On one side is a spacious quay, with a crane for the delivery of goods, where ships of 300 tons burthen may discharge or take in cargoes with perfect safety. Another side is adorned with a noble stone building, which is now used as an inn, and is surmounted with the Percy arms. North Shields, forming part of the parish of Tynemouth, has no parish church, but it possesses several chapels of ease, and meeting-houses for almost every class of dissenters. The other public structures and establishments here are a theatre, a dispensary, and a large school-house, erected by subscription, in commemoration of the royal jubilee, where a great number of boys and girls are educated on the Lancastrian plan. Here are likewise many well-conducted and flourishing benefit societies, an asylum for sick and friendless seamen, and a lying-in-hospital. A subscription library has also been opened in North Shields, and is said to contain an extensive collection of valuable books.

The harbour of North Shields is calculated to accommodate 2500 sail of ships; and in spring tides, vessels of 500 tons burthen can pass the bar without danger. The vessels belonging to this port, exclusive of small coasters, are stated in the "Historical View of Northumberland," to amount to 1000; but this number, we presume, includes the shipping of Newcastle and South Shields also, of which North Shields may justly claim one half. One great inconvenience complained of by the commercial interest here and at South Shields, is the want of an independent custom-house; which obliges the captains of all vessels sailing from this port to clear their ships at Newcastle, a distance of ten miles up the river.

The principal trade of North Shields, as of the river Tyne generally, consists in the exportation of coals to London, and other parts of the eastern coast of England; but some vessels are likewise employed in the Baltic and American trade; and during the late wars, a great number was

hired to government for the transport service. The manufactures established here are chiefly such as depend upon the shipping interest, as ship and boat-building, rope and sail-cloth making, brewing, baking, &c.; but there are likewise in North Shields a foundery for cast iron, an extensive tannery, one skinnery, a tobacco manufactory, a glove manufactory, and five hat manufactories.

The seamen of this port are frequently very riotous and turbulent, when they want a rise of wages, or are in any way dissatisfied with the conduct of the ship-owners. In these instances they have generally acted upon a regular plan; forcing every sailor to remain on shore, and preventing any vessel from proceeding to sea until their demands were complied with. An alarming combination of this kind was formed in the months of September and October last, (1815,) and threatened such serious consequences, as to render government interference necessary, when order was happily restored without bloodshed.

North Shields, according to the parliamentary returns of 1811, contains 804 houses, and a population of 7699 persons.

For some further account of this port and the adjoining country, see the articles NEWCASTLE, TYNE, TYNEMOUTH, and South SHIELDS. A Historical and Descriptive View of the County of Northumberland, &c. two vols. 8vo. Newcastle, 1812.

SHIELDS, *South*, a market-town and sea-port in the parish of Jarrow, east division of Chester ward, and county palatine of Durham, situated directly opposite to North Shields, at the distance of 21 miles N.N.E. from the city of Durham, and 278 N.N.E. from London. Like North Shields, it owes its importance chiefly to the coal trade and shipping interest, but the proportion of manufactures carried on here is greater than at the former town. About fifty years ago this place possessed upwards of two hundred salt-pans, but that branch of business has greatly declined, and others of higher importance are substituted in its stead, as ship-building, and the manufacture of glass, soap, &c. South Shields was constituted a market-town by bishop Trevor, in the year 1770. The market-day is Wednesday, and there are two annual fairs, on the 24th of June and the 4th of September. The vessels belonging to this port amount to about 300 in number. The church, which is a chapel of ease under Jarrow, is evidently a structure of great antiquity; the style of its architecture being that of the Anglo-Norman era. Some antiquaries are of opinion that there was a Roman station at the point of land near South Shields, which forms the southern entrance into the Tyne, and the conjecture is certainly probable, though by no means authenticated as a fact.

South Shields, like North Shields, has of late years greatly increased in population and extent; but it is destitute of many of the advantages possessed by the other. Here are, besides the established church, several dissenting meeting-houses; also several benefit societies and charity-schools. The petty sessions for the east division of Chester ward are held in the town-house here, which is a respectable building, situated in the centre of the market-place. Most of the streets of this town, however, are narrow, and the houses very indifferently built. According to the parliamentary returns of 1811, it contains 528 houses, and a population of 9001 persons.

About two miles to the westward of South Shields is the village of Jarrow, celebrated for its monastery, which was originally founded about the year 685; but has since been frequently rebuilt. This religious house was dedicated to St. Paul, and appropriated to the reception of Benedictine monks,

monks. Its remains, together with the church of Jarrow, occupy the summit of an elevated ridge, but display little worthy of notice. The History and Antiquities of the County Palatine of Durham, by W. Hutchinſon, 4to. 1778. Beauties of England and Wales, vol. vi. by E. W. Brayley, and John Britton.

SHIFFNAL, a market-town in the pariſh of Shiſſnal, hundred of Brimſtreſy, and county of Salop, England, is ſituated at the diſtance of 19 miles E. by S. from Shrewſbury, and 143 miles N.W. from London. The market-day here is Friday weekly, and there are fairs on the 5th of Auguſt and the 22d of November. The petty ſeſſions for Shiſſnal diviſion of the hundred are held here; but in other reſpects this town is a trifling place, the whole pariſh, which is extenſive, and includes four townſhips, containing, according to the parliamentary returns of 1811, only 808 houſes, and 4061 inhabitants.

SHIFT, a term in *Muſic*, uſed for conducting the hand on the finger-board of the violin, and inſtruments with a neck.

By moving the left hand a little towards the bridge, and placing the firſt finger where the ſecond was, on the ſecond ſtring of the violin, in the natural poſition of the hand, it will produce C inſtead of B, and the little finger will then produce C on the firſt ſtring, its octave: and this is called the *half ſhift*. The firſt, or *whole ſhift*, is placing the firſt finger where the third was, in the natural poſition of the hand, which will produce D on the ſecond ſtring, and the little finger its octave on the firſt. The next movement of the hand towards the bridge is placing the firſt finger on E of the ſecond ſtring, when the little finger will give its octave on the firſt ſtring, and this is termed the *double ſhift*; each ſhift commanding all the intermediate notes of an octave to the firſt finger. By this means a half, a whole note, or any number of notes, may be gained upwards upon each ſtring, to the end of the finger-board. A readineſs at theſe ſhifts, on ſhort notice, in all keys, and in true intonation, is ſaid to be *knowing the finger-board well*. At preſent (1809) high ſolo parts for the violoncello are written in the treble clef.

SHIFT, in *Ship-Building*, a term applied to diſpoſing the butts of the planks, &c. ſo that they may over-launch each other, without reducing the length, and ſo as to gain the moſt ſtrength. The planks of the bottom, in Britiſh-built ſhips of war, have a ſix-feet ſhift, with three planks between each butt, ſo that the planks run twenty-four feet long. In the bottoms of merchant-ſhips, they have a ſix-feet ſhift, with only two planks between each butt, making but eighteen-feet planks in length. The ſhift of the timbers is from three feet to ten feet ſix inches in length, according to the ſize of the ſhip.

SHIFTED, in *Sea Language*, denotes the ſtate of a ſhip's ballaſt or cargo, when it is ſhaken from one ſide to the other, either by the violence of her rolling in a turbulent ſea, or by an extraordinary inclination to one ſide, when under a great preſſure of fail. This circumſtance rarely happens, unleſs to thoſe cargoes which are ſtowed in bulk, as corn, falt, and ſuch materials.

SHIFTED, as expreſſed of the wind, implies *altered*.

SHIFTER, a perſon appointed to aſſiſt the ſhip's cook, particularly in waſhing, ſleeping, and ſhifting the falt provisions.

SHIFTING, in *Ship-Building*, the act of ſetting off the length of the planks, &c. of a ſhip, ſo that the butts may over-launch each other, as to produce a good ſhift. (See **SHIFT**.) Replacing old ſtuff with new is alſo called ſhifting.

VOL. XXXII.

SHIFTING a Tackle, in *Sea Language*, the act of removing the blocks of a tackle to a greater diſtance from each other, on the object to which they are applied, in order to give a greater ſcope or extent to their purchaſe. This operation is otherwiſe called *fleeing*.

SHIFTING the Helm, is altering its poſition from one ſide to the other, or from one ſide to midſhips.

SHIFTING the Vocal, or *Meſſenger*, changing its poſition on the capſtern, ſo as to heave in the cable from the ſtarboard or larboard ſide.

SHIFTING of Plants, in *Gardening*, the buſineſs of removing plants in pots, from ſmaller into larger ones, &c. to give them freſh earth or mould. It is neceſſary occaſionally, in all plants in pots, to aſſiſt them with larger ones, according as the advanced growth of the particular ſorts renders it proper; and at the ſame time to ſupply an additional proportion of freſh earth about the root-fibres of the plants, to promote their growth: and ſometimes, for the application of freſh compoſt, either in part or wholly, from the plants having remained long unremoved, and the old earth in the pots being much decayed, or on account of ſome defect of growth in the particular plants.

In regard to the neceſſity of ſhifting, it is, in ſome degree, according to the advancing growth of the different ſorts of plants: ſome ſorts of a ſtrong free growth require ſhifting once every year or two: others, more moderate growers, or of more ſettled growths, once in two or three years; and ſome large growing kinds, which are advanced to a conſiderable ſize, having been occaſionally ſhifted, in their increaſing growth, from ſmaller into larger pots of different proportionable ſizes, and ſome from large pots into tubs of ſtill larger dimenſions, as large plants of the American aloe, orange, and lemon-tree kinds, &c. in that advanced ſtate, ſometimes only need occaſional ſhifting once in three or ſeveral years, eſpecially when the pots or tubs are capacious, containing a large ſupply of earth, and are occaſionally reſreſhed with ſome new compoſt at top, and a little way down, round the ſides about the extreme roots. And in ſome ſmall ſlow-growing plants, as in many of the ſucculent tribe, ſhifting them once in two or three years may be ſufficient; other ſorts want ſhifting annually into larger pots, according as they advance in a free growth, as the hardy and tender kinds of herbaceous and ſhrubby plants, &c. And ſome of the tender annual flower-plants, cultivated in pots, and forwarded in hot-beds, being planted firſt in ſmall pots, want ſhifting, in their increaſing growth, into larger ſizes, once or twice the ſame ſeaſon, as from April to the beginning of June, when being ſhifted finally into the requiſite full-ſized pots, they remain during their exiſtence. But though large-grown plants, either of the ſhrub or tree kind, as well as other plants of large growths, after being finally ſtationed in the full-eſt ſized large pots and tubs, ſucceed ſeveral years without ſhifting, they ſhould in the interval have the top earth looſened, and down round the ſides to ſome little depth, removing the looſened old ſoil, and filling up the pots, tubs, &c. with freſh earth, ſettling it cloſe by a moderate watering.

The uſual ſeaſon for occaſional ſhifting ſuch plants as require it, is principally the ſpring and autumn, as from March to May for the ſpring ſhifting; and from Auguſt to the end of September for the autumn; though in plants that can be removed with the full balls of earth about the roots, it may be occaſionally performed almoſt at any time; however, for any general ſhifting, the ſpring and autumn are the moſt ſucceſſful ſeaſons, as the plants then ſooner ſtrike freſh root; and many ſorts preferably in the ſpring, by having the benefit of the ſame growing ſeaſon, and that of ſum-

mer. In performing the business, it is mostly proper to remove the plants from the smaller to the larger pots, with the balls of earth about the roots, either wholly, or some of the outward old earth, the dry or matted radical fibres only being carefully trimmed away, so as not to disturb the principal roots in the bodies of them, as by this means the plants receive but little check in their growth by the removal. Sometimes, when any particular plants, shrubs, or trees, &c. in their pots, discover by their tops that they are in a declining state, as probably the defect may be either in the root, or the old balls of earth, it may be proper to shake all the earth entirely away, in order to examine the roots, and to trim and dress them as the case may require, replanting them in entire fresh compost or mould.

And in preparing for this sort of work, where necessary to give larger pots, &c. it is proper to provide them of suitable sizes, in some regular gradation larger than the old ones, according to the nature and growth of the plants, the whole being placed ready, with a proper quantity of fresh compost earth, in proportion to the number and size of the plants intended to be shifted: then let those plants intended to be removed with balls, be taken out of their old pots separately, with the whole balls or clumps of earth about the roots as entire as possible; and when large, or tolerably full, with a knife trim off some of the outward loosest earth, and the extreme fibres of the roots; but when small, and adhering together compactly, the whole may be preserved entire; and in either case, where there are very matted, dry, or decayed fibres surrounding the balls, they should be trimmed as it may seem necessary: in those of a fresh lively growth, the loose straggling parts only should be cut away. The requisite pruning, trimming, or dressing in the heads or tops, should also be given where it may seem proper, according to the state of growth, and the natural habit of the different plants; but many sorts require little or none of this sort of attention.

Then having prepared the intended pots for the reception of the plants, by placing some pieces of tile or oyster-shell, &c. loosely over the holes at bottom, and laid in a little fresh earth, two, three, or four inches deep, or more, according to the size of the pot, the plant should be set in with its ball of earth, as above, filling up around it with more fresh mould, raising it an inch or two over the top of the ball; and giving directly a moderate watering, to settle the earth close about the ball and roots regularly in every part, in a proper manner: in such cases where the ball in particular plants appears very compactly hard and binding, it may be proper to loosen it a little, by thrusting a sharp-pointed stick down into the earth in different parts, giving it a gentle wrench, to open the earth moderately; or sometimes it may also be proper to trim away some of the old earth on the top and sides, then planting it as above, and filling up round and over the ball with fresh earth, and watering it afterwards.

Also, in shifting hardy or tender, shrubby, succulent, or herbaceous plants, when any appear of a sickly, weak, or unhealthy growth, it may be advisable to clear off a considerable part of the outward old earth from the balls about the roots, or, in some cases, to shake it wholly away, that the defects in the growths, occasioned either by faults in the roots or in the earth, may be removed by pruning out any decayed or bad parts of the roots, and replanting them wholly in fresh earth.

And sometimes particular sorts of plants in pots require shifting, more for the advantage of having fresh earth, than for want of new, or larger pots; and as in this case some of the same pots may be still of an eligible size to repot them in, these pots should be well cleaned from all the adhering parts

of the old earth, and be replenished with entire new, at the time of repotting the plants; which being removed out of their pots, either with the entire balls about the roots, and part of the old mould cleared off all round, to admit of a larger portion of fresh earth in the pot at replanting; or in some, appearing of an infirm or declining habit, the whole balls of old earth displaced clean to the roots; then having furnished the pots with fresh earth, the plants should be replaced in them, filling up the pots regularly with a sufficiency of the same fresh mould, and finishing with a moderate watering to settle the whole close about their roots.

Likewise after shifting, when the plants are not watered at the time, a moderate watering, both to the earth in the pots to settle it close about the roots, and in most sorts highly over the tops or heads of the plants, should be given, in order to wash off any foulness; then the pots of plants should be set in their respective stations in the garden, &c.: the hardy kinds, if warm sunny weather, may be placed in a shady border for two or three weeks, till they have struck fresh root in the new earth: the tender sorts should be disposed in their places among the green-house and stove-plants, or to have the benefit of shade in the middle of hot sunny days, till fresh struck, or probably some of the more tender particular sorts may require to be plunged in a hot-bed or bark-bed, especially some of the stove kinds: some principal sorts of the more curious or tender green-house plants, in order to expedite their fresh-rooting more effectually; and sometimes tender annuals in hot-beds, potted in their early young growth, may require to be replunged in the hot-bed to fresh strike, and forward them till June; but generally all the full ground or open air plants only require a little occasional shade in hot dry weather the first two or three weeks, and some shifted with full balls about the roots, only need occasional watering; afterwards, on the whole, both the hardy and tender kinds should have repeated moderate waterings given them, according to their kinds.

SHIFTS, such parts of a farm as are allotted for the reception of either stock or crops. It is also a term applied to the rotations of cropping lands: thus we have three, four, five, and six-course shifts. See *Course of CROPS*.

SHIJASCHKOTAN, in *Geography*. See SYASKUTAN.

SHIITES, in the *History of Mahometan Sects*, were the opponents of the *Kharejites*; see that article. This name properly signifies *sectaries* or *adherents* in general, but is peculiarly used to denote those of Ali Ebn Abi Taleb; who maintain him to be lawful caliph and imam, and that the supreme authority, both in spirituals and temporals, of right belongs to his descendants, notwithstanding they may be deprived of it by the injustice of others, or their own fear. They also teach, that the office of imam is not a common thing, depending on the will of the vulgar, so that they may set up whom they please; but a fundamental affair of religion, and an article which the prophet could not have neglected, or left to the fancy of the common people; nay some, thence called Imamians, go so far as to assert, that religion consists solely in the knowledge of the true imam. The principal sects of the Shiites are five, which are subdivided into an almost incredible number; so that some understand Mohammed's prophecy of the seventy odd sects, of the Shiites only. Their general opinions are, 1. That the peculiar designation of the imam, and the testimonies of the Koran and Mohammed concerning him, are necessary points. 2. That the imams ought necessarily to keep themselves free from light sins as well as more grievous. 3. That every one ought publicly to declare who it is that he adheres

heres to, and from whom he separates himself, by word, deed, and engagement, and that herein there should be no dissimulation. But in this last point some of the Zeidians, a sect so named from Zeid, the son of Ali, surnamed Zein al Abedin, and great grandson of Ali, dissented from the rest of the Shiites. As to other articles, wherein they agreed not, some of them came pretty near to the notions of the Motazalites, others to those of the Mohabbabites, and others to those of the Sonnites. Among the latter of these, Mahommed al Baker, another son of Zein al Abedin's, seems to claim a place: for his opinion as to the will of God was, that God willeth something *in* us, and something *from* us, and that he willeth *from* us he hath *revealed* to us; for which reason he thought it preposterous that we should employ our thoughts about those things which God willeth *in* us, and neglect those which he willeth *from* us: and as to God's decree, he held that the way lay in the *middle*, and that there was neither compulsion nor free liberty. A tenet of the Khattabians, or disciples of one Abu'l Khattab, is too peculiar to be omitted. These maintained paradise to be no other than the *pleasures of this world*, and *hell-fire* to be the *pains* thereof, and that the world will never decay: which proposition being first laid down, it is no wonder they went farther, and declared it lawful to indulge themselves in drinking wine and whoring, and to do other things forbidden by the law, and also to omit doing the things commanded by the law.

Many of the Shiites carried their veneration for Ali and his descendants so far, that they transgressed all bounds of reason and decency; though some of them were less extravagant than others. The Gholaites, who had their name from their *excessive* zeal for their imams, were so highly transported therewith, that they raised them above the degree of created beings, and attributed divine properties to them; transgressing on either hand, by deifying of mortal men, and by making God corporeal: for one while they liken one of their imams to God, and another while they liken God to a creature. The sects of these are various, and have various appellations in different countries. Abd'allah Ebn Saba, (who had been a Jew, and had asserted the same thing of Joshua the son of Nun,) was the ring-leader of one of them. This man gave the following salutation to Ali, *viz. Thou art Thou, i. e. thou art God*: and hereupon the Gholaites became divided into several species; some maintaining the same thing, or something like it, of Ali, and others of some of one of his descendants; affirming that he was not dead, but would return again in the clouds, and fill the earth with justice. But howmuchsoever they disagreed in other things, they unanimously held a *metempsychosis*, and what they call *al Holul*, or *the descent* of God on his creatures; meaning thereby that God is present in every place, and speaks with every tongue, and appears in some individual persons; and hence some of them asserted their imams to be *prophets*, and at length *gods*. The Nofairians and the Ishakians taught that spiritual substances appear in grosser bodies; and that the angels and the devil have appeared in this manner. They also assert that God hath appeared in the form of certain men; and since, after Mohammed, there hath been no man more excellent than Ali, and, after him, his sons have excelled all other men, that God hath appeared in their form, spoken with their tongue, and made use of their hands, for which reason, say they, *we attribute divinity to them*. And to support these blasphemies, they tell several miraculous things of Ali, as his moving the gates of Khaibar, which they urge as a plain proof that he was endued with a particle of divinity, and with sovereign power, and that he was the person in whose

form God appeared, with whose hands he created all things, and with whose tongue he published his commands; and therefore they say he was in being before the creation of heaven and earth. In so impious a manner do they seem to wrest those things which are said in scripture of Christ, by applying them to Ali. These extravagant fancies of the Shiites, however, in making their imams partakers of the divine nature, and the impiety of some of those imams in laying claim thereto, are so far from being peculiar to this sect, that most of the other Mohammedan sects are tainted with the same madness; there being many found among them, and among the Sufis especially, who pretend to be nearly related to heaven, and who boast of strange revelations before the credulous people. To this account of the Shiites of the first ages we shall subjoin a brief mention of the great schism at this day subsisting between the Sonnites and the Shiites, or partisans of Ali, and maintained on either side with implacable hatred and furious zeal. Though the difference arose at first on a political occasion, it has, notwithstanding, been so well improved by additional circumstances, and the spirit of contradiction, that each party detest and anathematize the other as abominable heretics, and farther from the truth than either the Christians or the Jews. The chief points wherein they differ are, 1. That the Shiites reject Abu Becr, Omar, and Othman, the three first caliphs as usurpers and intruders; whereas the Sonnites acknowledge and respect them as rightful imams. 2. The Shiites prefer Ali to Mohammed, or, at least, esteem them both equal; but the Sonnites admit neither Ali, nor any of the prophets, to be equal to Mohammed. 3. The Sonnites charge the Shiites with corrupting the Koran, and neglecting its precepts; and the Shiites retort the same charge on the Sonnites. 4. The Sonnites receive the Sonna, or book of traditions of their prophet, as of canonical authority; whereas the Shiites reject it as apocryphal and unworthy of credit. And to these disputes, and some others of less moment, is principally owing the antipathy which has long reigned between the Turks, who are Sonnites, and the Persians, who are of the sect of Ali. Sale's Koran, Introd.

SHILACON, in *Geography*, a town of Egypt, on the E. side of the Nile; 8 miles N. of Cairo.

SHILL, in *Agriculture*, provincially to separate the rind, husk, or skin, as of oats, or other crops. It also signifies the turning a small portion of milk into curd.

SHILLAY, in *Geography*, a small island near the W. coast of the island of Lewis; 5 miles W.S.W. of Toe Head. N. lat. 54° 48'. W. long. 7° 14'.

SHILLELAH, a town of Algiers, anciently *Turaphilum*; 10 miles S.W. of Burg Hamza.

SHILLER-STONE, or SHILLER-Spar, in *Mineralogy*, the diallage metalloide of Haiy, a mineral nearly allied to serpentine. (See SERPENTINE.) It is considered by some mineralogists as a crystalline variety of that rock; in which it generally occurs, either in beds or disseminated. Its colour is commonly olive-green, with a shining lustre, which is sometimes semi-metallic. The structure is lamellar, with joints in one direction: it yields to the knife. In the vicinity of New Radnor, in Wales, there is a rock of this mineral intermixed with steatite.

SHILLING, an English silver coin, equal to twelve pence, or the twentieth part of a pound.

Froherus derives the Saxon *scilling*, whence our *shilling*, from a corruption of *silqua*; proving the derivation by several texts of law, and among others, by the twenty-sixth law, *De annis legatis*. Skinner deduces it from the Saxon *scild*, *shield*, by reason of the escutcheon of arms upon it.

Bishop Hooper derives it from the Arabic *scheele*, signifying

SHILLING.

fying a *weight*; but others, with greater probability, deduce it from the Latin *scilicet*, which signified in that language, a *quarter of an ounce*, or the forty-eighth part of a Roman pound. In confirmation of this etymology, it is alleged, that the shilling kept its original signification, and bore the same proportion to the Saxon pound, as *scilicet* did to the Roman and the Greek, being exactly the forty-eighth part of the Saxon pound; a discovery which we owe to Mr. Lambarde. *Explicatio Rerum et Verborum* in Legg. Sax. voc. Libra.

Others say, that the shilling was at first a German appellation, *schilling*; coins of which name had been struck at Hamburgh in 1407.

However, the Saxon laws reckon the pound in the round number at fifty shillings, but they really coined out of it only forty-eight; the value of the shilling was five-pence; but it was reduced to four-pence above a century before the Conquest; for several of the Saxon laws made in Athelstan's reign, oblige us to take this estimate. Thus it continued to the Norman times, as one of the Conqueror's laws (Legg. Sax. p. 221.) sufficiently ascertains; and it seems to have been the common coin by which the English payments were adjusted. After the Conquest, the French *solidus* of twelve-pence, which was in use among the Normans, was called by the English name of shilling; and the Saxon shilling of four-pence took a Norman name, and was called the *groat*, or great coin, because it was the largest English coin then known in England.

The groat, from the French *gros*, a large piece, was introduced by Edward III. in 1354, and continues, though not in common circulation, to this day. The half-groat, or two-pence, is of the same date and continuance. In Scotland, about the year 1553, were first coined testoons, or shillings, bearing the bust of the queen, and the arms of France and Scotland on the reverse: they being of the same intrinsic value as those of England, were then worth four shillings, and the half-testoon two, Scottish money.

It has been the opinion of bishops Fleetwood and Gibson, and of the antiquaries in general, that though the method of reckoning by pounds, marks, and shillings, as well as by pence and farthings, had been in constant use even from the Saxon times, long before the Norman conquest, there never was such a coin in England as either a pound or a mark, nor any shilling or testoon, till the year 1503, 1504, or 1505; but in the twentieth year of king Henry VII. (A.D. 1505,) a few silver shillings, or twelve-pences, were coined, being about one-half the size of the modern shillings, or forty out of a pound weight of silver, which were fair and broad pieces. These, however, it is said, have long since been solely confined to the cabinets of collectors.

Mr. Clarke combats this opinion, alleging, that some coins mentioned by Mr. Folkes, under Edward I. were probably Saxon shillings new minted, and that archbishop Aelfric (Gram. Saxon. p. 52, at the end of Somner's Saxon Diction,) expressly says, that the Saxons had three names for their money, *viz.* mancuses, shillings, and pennies. He also urges the different value of the Saxon shilling at different times, and its uniform proportion to the pound, as an argument, that their shilling was a coin; and the testimony of the Saxon gospels, in which the word we have translated *pieces of silver*, is rendered shillings, which, he says, they would hardly have done, if there had been no such coin as a shilling then in use. Accordingly, the Saxons expressed their shilling in Latin by *scelus* and *argenteus*.

He farther adds, that the Saxon shilling was never ex-

pressed by *solidus*, till after the Norman settlements in England: and howsoever it altered during the long period that elapsed from the Conquest to the time of Henry VII. it was the most constant denomination of money in all payments, though it was then only a species of account, or the twentieth part of the pound sterling: and when it was again revived as a coin, it lessened gradually as the pound sterling lessened, from the twenty-eighth of Edward III. to the forty-third of Elizabeth. Clarke on Coins, &c. p. 120. 152. 155. 200. 376.

Silver farthings ceased with Edward VI., but the silver half-pence continued the sole coins till Charles II. The silver penny was much used to the end of the reign of George I., and so far from being no where to be found, as Hume affirms (Hist. vol. vi.), is superabundant of every reign since that period, not excepting even the present reign of George III.

In the year 1560, there was a peculiar sort of shilling struck in Ireland, of the value of nine-pence English, which passed in Ireland for twelve-pence. The motto on the reverse of these is, *POSUI DEUM ADJUTOREM MEUM*.

Eighty-two of these shillings, according to Malynes, went to the pound, they therefore weighed twenty grains one-fourth each, which is somewhat heavier in proportion than the English shilling of that time, sixty-two of which went to the pound, each weighing ninety-two grains seven-eighths; and the Irish shilling being valued at the Tower at nine-pence English, that is, one-fourth part less than the English shilling, it should, therefore, proportionably weigh one-fourth part less, and its full weight be somewhat more than sixty-two grains; but some of them found at this time, though much worn, weighed sixty-nine grains. In the year 1598, five different pieces of money of this kind were struck in England for the service of the kingdom of Ireland.

These were shillings to be current in Ireland at twelve-pence each; half shillings to be current at six-pence; and quarter shillings at three-pence.

Pennies and halfpennies were also struck of the same kind, and sent over for the payment of the army in Ireland. The money thus coined was of a very base mixture of copper and silver; and two years after there were more pieces of the same kinds struck for the same service, which were still worse; the former being three ounces of silver to nine ounces of copper; and these latter only two ounces eighteen pennyweights, to nine ounces two pennyweights of the alloy. Simon's Irish Coins.

The Dutch, Flemish, and Germans, have likewise their shilling, called *schelin*, *schilling*, *scalin*, &c.; but these, not being of the same weight or fineness with the English shilling, are not current at the same value. See *SCHILLING* and *SKILLING*.

The pound Flemish in accounts is divided into twenty shillings, and subdivided into twelve groots or pence Flemish. The coins in Holland are good shillings, or escalins, and half ditto, at six and three stivers; unstamped or base shillings reckoned at five and a half stivers, and called *sesthalfs*. At Hamburgh, accounts are kept in shillings, sixteen of which are equal to a mark, and each containing twelve pfenings; and sometimes in pounds, shillings and pence Flemish; the pound being equal to twenty shillings, and the shilling equal to twelve-pence or grotes.

The English shilling is worth about twenty-three French sols; those of Holland and Germany about eleven sols and a half; those of Flanders about nine. The Dutch shillings are also called *sols de gros*, because equal to twelve gros.

The

The Danes have copper shillings, worth about one-fourth of a farthing sterling. See COIN.

SHILLUK, in *Geography*, a town of Africa, in the kingdom of Sennaar, on the E. side of the river Bahr-el-Abiad, and not far removed from it. This town is built of clay, and its inhabitants are idolaters. They have no other clothing than bands of long grafs, which they pass round the waist and between the thighs. They are all black, and those of both sexes shave their heads. The people of Shilluk have the dominion of the river, and take toll of all passengers, in such articles of traffic as pass among them. These people, who assume importance from their command of the river, are represented as hospitable to those who come among them in a peaceable manner, and as never betraying those to whom they have once avowed friendship; 50 miles W. of Sennaar.

SHILOH, in *Scripture Criticism*, a term that occurs in Jacob's celebrated prophecy concerning the Messiah (Gen. xlix. 10.); concerning the etymology and application of which, biblical commentators have differed in opinion. "The sceptre shall not depart from Judah, and a law-giver from between his feet; till *Shiloh* come; and to him shall the gathering of the people be." The word Shiloh, says one writer (Mr. Mann), is a modern reading; unknown in any other part of the scripture, or any of the old commentators; coined by the Jewish correctors of the bible into שִׁלֹּה, a word of no signification; whereas the LXX read שֶׁלֹּה, that is, אֲשֶׁר לוֹ, he, to whom it is; he, to whom it, viz. the sceptre, belongs; ὃ ἀποκρίνεται; he for whom it is reserved, as it is in the original best edition of the LXX version, as Justin Martyr long ago affirmed, (Dial. cum Tryph.), and as it now stands in the Alexandrian MS. And if this be the true meaning, it plainly refers to the king of the Jews; for whom the sceptre was reserved, and to whom the people were to be gathered. Mr. Ainsworth and some others render Shiloh the prosperor or safe-maker; others the peace-maker, from שָׁלוֹם; all which agree to the same person. But the most probable interpretation, as the author of Mordecai's Letters, (Mr. Taylor,) apprehends, is given us by the very learned and judicious Dr. Hunt, professor of Arabic at Oxford. He understands the true etymology of the word *Shiloh* to remain in the Arabic شَلَا, *shela*, liberavit, subduxit ab angustia et exitio. According to this etymology, *Shiloh* will be the deliverer from distress and destruction; a title, which justly belongs to Jesus Christ, the Lord of life, and Saviour of the world. If it should be objected to this etymology, that the *jod* (י) is wanting between the *shin* and the *lamed*, he observes, that in the Samaritan copy of Genesis, xlix. 10. the word is written without the *jod*, as it is likewise in one of the most ancient Hebrew MSS. which Dr. Kennicot has consulted on this text. Some moderns have pretended, in order to evade the prophetic force of this text, that the sceptre departed from Judah before the advent of Christ, by its falling into the hands of foreigners, which objection is sufficiently answered by Cunæus (De Republ. Heb. l. 50. c. 9.) and others: who have shewn, that the text only regards the continuance of the Jewish state; and that Judea, as separated from Israel, should remain a kingdom till the coming of the Messiah. On the other hand, Abravanel and others suppose; that the sceptre is not yet departed from Israel; and Menasseh Ben Israel alleges, that it is still in the hands of the tribe of Judah. The ancients undoubtedly understood this text of the Messiah. The Chaldee Paraphrast says, "He that hath dominion shall not be taken away from Judah, nor a scribe from his children's children, until the

time when Christ shall come, whose the dominion is; and him shall the people (or nations) obey." And the Jerusalem Targum says, "Kings shall not cease from the house of Judah, nor doctors that teach the law from his children's children, until the time that Christ do come, whose kingdom is; and all the kings of the earth shall be subject unto him;" so that both the Targums confine the sense to this; that the peoples (*i. e.* both Jews and Gentiles) should gather unto and obey Christ: or, in other words, that the person here spoken of should be the prince that should reign over all; προσδοκῶν ἐλθεῖν, as the LXX say in this place; and that this should happen before Judah should cease to be a kingdom: which is verified by fact. Ben Mordecai's Letters, Letter iv.

SHILOH, or *Silo*, in *Ancient Geography*, a famous city of Ephraim (Josh. xviii. xix. xxi.), 12 miles distant from Shechem or Sichem, according to Eusebius, or 10 miles according to Jerom, and situated, according to both, in Acrabattene. In Jerom's time this city was ruined, nothing remaining but the foundation of the altar of burnt offerings, which had been erected when the tabernacle was there. At Shiloh, Joshua assembled the people to make the second distribution of the land of promise. (Josh. xviii. 1, 2, 3.) Here the tabernacle of the Lord was set up, when the people were settled in the country. (Josh. xix. 51.) The ark and the tabernacle of the Lord continued at Shiloh, from A.M. 2560, when it was set up by Joshua, to A.M. 2888, B.C. 1116, when it was taken by the Philistines, under the administration of the high-priest Eli. At Shiloh Samuel began to prophesy. (1 Sam. iv. 4.) Here the prophet Abijah dwelt. (1 Kings, xiv. 2.) Jeremiah foretold that the temple of Jerusalem should be reduced to the same condition as Shiloh was. (Jer. vii. 12. 14. xxvi. 6. 9.) After the return of the ark out of the country of the Philistines, instead of returning it to Shiloh, it was taken to Kirjath-jearim. (1 Sam. vi. 21.) Mr. Roland conjectures, that from the name Shiloh, Pausanias (l. vi. c. 24.) took occasion to say, that Silenus, the companion of Bacchus, was buried in Palestine. Benjamin of Tudela affirms, that the tomb of Samuel was to be seen here.

SHIM, in *Agriculture*, a tool of the tillage kind, used in breaking down and reducing the more stiff and heavy sorts of land, as well as cutting up and clearing them from weeds. They are made in different forms and constructions, to suit different purposes. In the Hertford Agricultural Survey by the Board of Agriculture, the writer remarks, that a tool of this kind is in use by Mr. Calvert, of Albury, which differs from those usually employed, in which the cutting-iron or plate, which for the work it is adapted for, as that of cutting up weeds on two-bout or four-furrow Essex ridges, or of cleaning land without ploughing or burying the soil, is a small segment of a large circle. It dispatches a ridge at a time, and is an implement that performs its business well, and which deserves the notice of the tillage-farmer in other places. It is readily altered for flat work, and is said to be had recourse to by other farmers with success in the same district.

And an useful tool of this sort has also been recommended by Mr. Young, in his Annals, the hint of which he took from the Berkshire one, and to which the beam and block is capable of being applied. In a wide interval, the three shares may be worked on a level. Between the rows of cabbages, after earthing up, the two external shares may be set to cut the weeds that are apt to rise on the sides of the ridges, without disturbing too much earth, and the centre share sunk to scrape the bottom of the furrow. The centre one may also be worked alone, between narrow rows. In forging the shares of all shims, he has well observed, that

the

the blacksmith should be careful to give them tendency enough *into* the ground, by bending them downwards: for want of this caution, he has found many of them to work badly. The wheel in the beam counteracts this tendency sufficiently when at work.

These tools should be upon all tillage farms, in all their different and best constructions.

SHIM Potatoe, a tool of the shim kind, used for cleaning potatoe crops.

SHIN, LOCH, in *Geography*, an extensive lake in the county of Sutherland, Scotland. This lake extends above 20 miles in length, but no where exceeds two miles in breadth, and seldom above a mile and a half. The banks are finely covered with natural wood, particularly the southern bank. It is connected with the Northern ocean, at Dornoch Frith, by the river Shin, which abounds with salmon, and forms several falls in the short course of eight miles. Sinclair's Statistical Account of Scotland, vol. xi. 1794.

SHINAAS, a small town of Persia, in the province of Laristan. This and Bostana lie between Linga and Cape Bostana; but though they are small towns, they afford some refreshment. Linga, the chief town of the piratical tribe of Joasmis on the Persian shore, is situated close to the sea, in N. lat. $26^{\circ} 33'$, about eight leagues from Kishm. It has a secure road, where ships may ride out a north-west gale in five fathoms water. Cape Bostana forms to the eastward the roadstead of the town of Mogoo, which is one of the most secure in the gulf; and this roadstead has to the westward the point improperly called Cortes. This roadstead is capable of holding the largest fleets.

SHINDAN, a mountain of Persia, between the provinces of Adirbeitzan or Azerbaijan and Ghilan.

SHINGARIN, a town of Africa, in the country of Sahara, where salt is found; 9 miles N. of Walet.

SHINGEIAT, a town of Africa, in the country of Bergoo; 90 miles W. of Wara.

SHINGLE, in *Agriculture*, a term sometimes applied to the thinnings of fir and other timber trees, in the northern districts, and which are of much use for various purposes in farming, as the making of fences, &c.

SHINGLE, a substance found and collected on the sea-beach, or shore, which is used for several purposes, as ballasting of ships, filling surface hollow drains, protecting the foundations of embankments, and other similar uses. See *SURFACE Drain*, and *SURFACE Draining*.

It is said to be a very valuable substance for the use of filling drains, as being particularly durable in its nature. In the county of Suffex, as well as in Essex, much of it is made use of in this way; in the former, under the denomination of sea-beach, or beach.

* **SHINGLE Shoal**, in *Geography*, a shoal in the English Channel, near the coast of Hampshire. N. lat. $50^{\circ} 38'$. W. long. $1^{\circ} 26'$.

SHINGLES. See **SHAMBLES**.

SHINGLES, or *Shides*, in *Building*, small pieces of wood, or quartered oaken boards, sawed to a certain scantling, or more usually cleft to about an inch thick at one end, and made like wedges, four or five inches broad, and eight or nine inches long. They are used in covering, especially for churches and steeples, instead of tiles or slates.

This covering is dear; yet where tiles, &c. are very scarce, and a light cover is required, it is preferable to thatch. If made of good oak, and cleft, not sawed, and well seasoned, shingles make a sure, light, and durable covering.

The building is first to be covered all over with boards, and the shingles then nailed thereon.

SHINGLES, in *Medicine*, the popular appellation of a *vesicular eruption*, which appears on the trunk of the body, extending generally half round, like a belt: whence probably the term is a corruption of the Latin word *cingulus*, or *cingulum*, signifying a belt. It is the *herpes zoster* of medical writers, the Greek word, ζοστης, having the same signification. It is sometimes called simply *zona*, or *zoster*. For the description and treatment of this curious and harmless, though sometimes painful, affection, see **HERPES Zoster**. See also Bateman's Practical Synopsis of Cutan. Diseases, p. 226.

SHINGLING, in the *Iron-Works*, in many parts of England, is the operation of hammering the sow, or cast iron, into blooms. The tongs, used for holding the iron in this operation, are called shingling-tongs, and the iron to be thus wrought is called a loop.

SHINING MOUNTAINS, in *Geography*, mountains that bound Louisiana on the west, which, though little known, are supposed to terminate in N. lat. 47° or 48° ; whence spring a number of rivers, that discharge themselves into the North Pacific ocean, Hudson's bay, the waters which lie between them, or the Atlantic ocean. They are also called the "mountains of bright stones," on account of the immense number of large crystals shooting from the rocks, and sparkling in the rays of the sun, so as to be seen at a great distance.

SHIOBERT el Yemeni, a town of Egypt, on the right bank of the Nile; 8 miles S.E. of Mehallet Kebir.

SHIONKAN, a town of Pegu; 8 miles N. of Sirian.

SHIP, a general name for all large vessels navigated with sails. Among people unacquainted with marine distinctions, this term has a very vague and indiscriminate acceptance. In the sea-language, however, it is more particularly applied to a vessel furnished with three masts, each of which is composed of a lower mast, topmast, and topgallant mast, with the usual rigging and appendages thereto belonging.

The sieur Aubin defines a ship, a timber building, consisting of various parts and pieces, nailed and pinned together with iron and wood, in such form, as to be fit to float, and to be conducted by wind and sails from sea to sea.

The invention of ships is very ancient, and, at the same time, very uncertain. Mythologists attribute it to *Dædalus*, and pretend that the wings he invented to save himself withal from the labyrinth of Crete, were nothing but sails, which he first gave to vessels, and with which he eluded the vigilance and pursuit of Minos. Others give the honour to Janus, on the credit of some ancient Greek and Latin coins, on one side of which is represented his double face, and on the reverse a ship. Lastly, others look on Noah to have been the first ship-builder.

The most celebrated ships of antiquity are, that of Ptolemy Philopater, which is said to have been two hundred and eighty cubits (*i. e.* four hundred and twenty feet) long, thirty-eight broad, and forty-eight high: it carried four thousand rowers, four hundred sailors, and three thousand foldiers. That which the same prince made to sail on the Nile, we are told, was three hundred and twelve feet long, forty-five feet broad, with a mast one hundred and twenty feet high. Yet these were nothing in comparison with Hiero's ship, built under the direction of Archimedes, on the structure of which Moschion, as we are told by Snellius, wrote a whole volume. There was wood enough employed in it to make sixty galleys. It had all the variety of apartments

SHIP.

ments of a palace: banquetting-rooms, galleries, gardens, fish-ponds, stables, mills, baths, a temple of Venus, &c. It was encompassed with an iron rampart, and eight towers, with walls and bulwarks, furnished with machines of war, particularly one, which threw a stone of three hundred pounds, or a dart twelve cubits long, the space of half a mile; with many other particulars related by Athenæus. Deipnosophist. lib. v. p. 204, &c. ed. Caufab. Lugd. 1657.

A ship is undoubtedly the noblest machine that ever was invented, and consists of so many various parts, that to form some idea of its importance and qualities will require the attention of the gentleman and the artist.

All ships at first were of the same form, whatever uses they were designed for; but the various ends of navigation, some of which were better answered by one form, some by another, soon gave occasion to build and fit out ships, not only different in size, but also in their construction and rigging: and as trade gave occasion to the fitting out large fleets of different kinds of merchant-ships, so ships of war became necessary to preserve them to their just owners.

The gradually improving state of shipping, in the last century, has kept pace with the regular advancement of every other branch of mechanical science. For, prior to that period, even our first-rate ships, now equal in perfection to those of any other rate, were then extremely defective, as their want of stability made their magnitude highly objectionable. These disadvantages have been gradually obviated, since the usual causes of instability have been discovered, the dimension enlarged, and the practical management familiarized; and they are now, in general, especially those that have most stability, admirable ships in most respects; as they sail well, and combine almost every good quality. Large as they are, they are perfectly manageable; and their evolutions are generally made with wonderful facility.

Second-rate ships, or those about ninety guns, have too generally those defects in their construction, which contribute to instability, arising from want of that capacity which most of the first-rates possess. The French, on this account, have discontinued this class of shipping.

Third-rate ships, or those of eighty and seventy-four guns upon two decks, are altogether the most useful and valuable ships in the navy; and possessing, in an eminent degree, all the properties of capacity, stability, and swiftness; the particulars of which last property will be found hereafter under SHIP-BUILDING, and this ship may be considered as the first of its class, from its great length and superior capacity.

The above are particularly distinguished as line-of-battle ships, and are found in general to suit the most powerful exigencies of the naval services. About ten years ago an additional lieutenant was appointed to the line-of-battle ships. See RATE.

Fourth-rate ships are those of fifty guns. They may be employed, if necessary, in the line-of-battle, but most suitable to be stationed amongst the foreign colonies, or on ex-

peditions of great distance; since these vessels are usually excellent for keeping and sustaining the sea.

Fifth-rate ships are frigates of from forty-four guns to thirty-two guns upon one deck, and even to fifty guns in America, (being restricted formerly to vessels of war with one deck); and though too weak to suffer the shock of a line-of-battle, they are very useful to accompany fleets, to lead the convoys of merchant-ships, to protect colonial commerce, to cruise in different stations, or to be sent express with necessary intelligence and orders.

The forty-four gun frigate being the most powerful, and most valuable of this class, has induced us to give a plate of one, so constructed as to have all the qualities which can possibly be united in one ship; for having but one deck, her breadth and height are so proportionable to her length, that she may be brought down in the water to that depth which is allowed to be the best sailing trim for ships in general. Ships of fifty and thirty-eight guns have four lieutenants. See RATE.

The *sixth-rate* includes all the smaller class of vessels in the navy, except the yacht, fire-ship, and bomb-vessel: they are classed as fifth-rates, to increase the pay; the former by way of distinction, the latter on account of the dangers to which they are exposed. Frigates of twenty-eight, twenty-four, and twenty guns, are in this class; but those with the thirty-two gun ship, in the former class, are so inferior to the forty-four and thirty-six gun frigate, as not to deserve notice nor continuance by a great maritime power. Ships of twenty guns, and all vessels upon the establishment of sloops of war, have two lieutenants. See RATE.

The large sloop of war and brig are very serviceable vessels to cruise against privateers, contraband trade, and for small convoys. Some of the latter have lately been built in this country, and are admirably adapted for good sea-boats, as well as good failers; their upper works being light, all unnecessary top-hamper avoided, having a snug stern, and apparently every good quality that can be expected in a vessel of this description.

One of these vessels, the *Raven*, upon being fitted for sea at Woolwich, under the directions of her very ingenious and active commander, captain William Layman, had, agreeably to his recommendation and wishes, among other alterations, the two foremost ports closed up, and the guns taken away; in lieu of which was fitted in midships, immediately before the fore-mast, a sixty-eight pounder carronade upon a fixed traverse carriage, so as to fire in almost every direction clear of the gunwale; and, in lieu of the two stern-chasers, a carronade of the same power, upon an inclined plane abaft. The wonderful accession of force derived from these alterations, and the great advantages to be derived from them in chace, in clearing an enemy's coast, &c. are too obvious to need comment.

Ships in the royal navy are commanded by post-captains to 22 guns; sloops by master and commander.

The following Table furnishes a correct list of the dimensions of ships of different rates. See RATE, under which article a less perfect table is inserted.

SHIP.

	Three Decks.		Two Decks.			Frigates.			Sloop.	East India Ships.	West India Ships.	
	1st Rate.	2d Rate.	3d Rate.		4th Rate.	5th Rate.			6th Rate.			
	Guns	110	98	80	74	50	40	38	36	22	18	
Length from the fore-side of the rabbet of the stern-post to the aft-side of the rabbet of the stem, on the gun or lower deck, or between the perpendiculars in merchant-ships -	Ft. In. 205 0	Ft. In. 185 0	Ft. In. 187 2	Ft. In. 180 0	Ft. In. 154 0	Ft. In. 160 3	Ft. In. 154 3	Ft. In. 137 0	Ft. In. 118 0	Ft. In. 110 2	Ft. In. 165 6 $\frac{1}{2}$	Ft. In. 124 9
Length of the keel for tonnage -	171 10 $\frac{1}{2}$	152 6 $\frac{3}{4}$	154 10 $\frac{1}{2}$	148 0	127 3 $\frac{3}{4}$	135 3 $\frac{1}{4}$	129 11 $\frac{1}{4}$	113 2 $\frac{1}{2}$	98 7 $\frac{1}{4}$	90 8 $\frac{1}{2}$	134 0	100 0
Extreme breadth -	53 7	51 0	50 10 $\frac{1}{2}$	48 8	41 11	40 8	39 8 $\frac{1}{2}$	38 0	31 6	29 9	42 0	32 0
Depth in hold -	24 0	21 6	21 7	19 9	17 6	13 6	13 5	13 4	10 3	8 6	17 0	14 9
Burthen in tons, builder's tonnage -	2547 $\frac{4}{9}$	2110 $\frac{5}{9}$	2125 $\frac{2}{9}$	1864 $\frac{4}{9}$	1189 $\frac{7}{9}$	1189	1089 $\frac{7}{9}$	869 $\frac{5}{9}$	520 $\frac{3}{9}$	427 $\frac{3}{9}$	1257	544
To carry guns on the	No. lbs.	No. lbs.	No. lbs.	No. lbs.	No. lbs.	No. lbs.	No. lbs.	No. lbs.	No. lbs.	No. lbs.	No. lbs.	
	Gun-deck -	30 32	28 32	30 32	28 32	26 28	—	—	—	—	—	26 18
	Middle-deck -	32 28	30 24	—	—	—	—	—	—	—	—	—
	Upper-deck -	32 24	30 18	32 28	30 24	28 18	30 24	28 18	28 18	24 12	18 12	10 18
	Quarter-deck -	12 12	12 9	14 9	12 9	—	10 12	10 9	10 9	—	—	—
Forecastle -	4 12	2 9	4 9	4 9	—	4 12	4 9	2 9	—	—	—	—
Totals	110	102	80	74	54	44	42	40	24	18	36	

Yacht, as a vessel of state, is usually employed to convey princes, ambassadors, or other great personages, from one kingdom to another, or even kings, to take pleasure in; of which our present gracious majesty was very fond. The Royal Sovereign yacht was launched for the particular service of his majesty at Deptford, in the year 1804; a ship whose exterior and interior are of incomparable beauty, but whose ornaments, splendid as they are, will scarcely be considered by the artist as more than adequate to the beauties of her form; and her qualities as an excellent sailer and good sea boat, from experiment, stand unrivalled. We have, therefore, given a plate of this excellent vessel, by a quarter of an inch scale.

Yachts, as may be expected from the purposes for which they are designed, are the most beautiful of all vessels which navigate the ocean; nor are their superb embellishments and stately apartments their highest excellencies. They are models, in which may be seen a combination of the best principles of the art.

The *fire-ship* differs but little in its outer construction from a sloop of war. She may be built light and very clean for fast sailing; but the inner part is very differently fitted, in the manner described under the article *Fire-Ship*.

The *bomb-vessel* is particularly constructed for throwing shells from a mortar. They are built very strong, and firmly ridged; are usually fitted with two bomb-beds, which are

platforms or strong frames of thick stuff and timber, laid transversely over large beams, and are rabbeted and solidly bolted all together. The mortar-bed, or carriage which carries the mortar, traverses on a large iron pivot, in the centre of the bomb-bed, in a circular excavation. The sides of the bomb-bed, round the mortar, are fitted with strong cheeks of oak, of an octagonal form; in every square of which are driven two ring-bolts, for traversing the mortar in any direction. The bomb-bed underneath, to support the shock in throwing the shell, has three ranges of large pillars, fix in a range, tenoned at the head and heel into large carlings fore and aft the bed, along the middle and sides, which are scored on the riders below, and into the beams above the pillars, standing double in the middle of the bed athwart-ships.

A strong compartment, called the shell-room, is built round the outside of the pillars. See *SHELL-ROOM*. See also *BOMB-Vessels* and *KETCH*.

SHIP, *Armed*. See *ARM*.

SHIP, *Guard*, is a vessel of war appointed to superintend the marine affairs in a harbour or river, and to see that the ships which are not commissioned have their proper watch kept duly, by sending her guard-boats around them every night: she is also to receive seamen who are impressed in time of war.

SHIP, *Hospital*, a vessel fitted up to attend on a fleet of men of war, and receive their sick or wounded; for which purpose

purpose her decks should be high, and her ports sufficiently large; her cables ought also to run upon the upper deck, to the end that the beds or cradles may be more commodiously placed between decks, and admit a free passage of the air, to disperse that which is offensive or corrupted. Falconer.

SHIP, *Lee-ward*. See *LEE-ward Ship*.

SHIP, *Merchant*, a vessel employed in commerce, to carry commodities of various sorts from one port to another.

Merchant shipping, in general, being scarcely definable into distinct classes, we cannot speak with that degree of precision of them as of those of the royal navy; because their respective forms and dimensions are dependent, almost entirely, on the local practice or ideas of their respective owners or constructors, and fluctuate accordingly. Those belonging to the East India Company are by far the largest, and are very fine ships, and of course rank in the first class of merchant ships. West India ships are little inferior to the former, but in size; and some of the largest have been employed occasionally either to the East or West Indies.

The East India ship (*Plate XII.*) has been actually built, and found upon trial to answer every purpose expected from her.

Some ships of a very fine model, being less burthened than West India ships, are employed in the Straits' trade; and others used in the East country trade, for carrying of timber, exceed either of the latter for size, the largest of them being no less than 700 tons.

SHIP of War, *Private*. See *PRIVATEERS*.

SHIP, *Store*, a vessel employed to carry artillery or naval stores, for the use of a fleet, fortrefs, or garrison.

SHIP, *Transport*. See *TRANSPORT Ship*.

SHIP, *Troop*. See *TROOP Ship*.

We shall here observe in general, that it is highly necessary to the health of seamen, that ships should be cleared of foul air; for it has been found by frequent experience, that air shut up, and confined in a close place, without a succession and fresh supply of it, becomes unwholesome, and unfit for the use of life. This is more sensibly so, if any stagnating water be pent up with it. But it grows still worse, if such an air as this is made use of in respiration; that is, becomes moister, and hotter, and phlogisticated, by passing and repassing through the lungs.

These bad effects, in different degrees, according to the different manner in which air is inclosed, are observed in many cases, particularly in deep wells and caverns of the earth, in prisons or close houses, where people are shut up with heat and nastiness; but most of all in large ships, in which, with the stench of water in the hold, many men being crowded up in those quarters, all the mentioned circumstances concur in producing greater mischiefs than would follow from any of them singly. For an account of Mr. Sutton's contrivance for clearing the holds of ships of the bad air contained in them, we refer to the article *AIR-Pipes*.

The mixture used sometimes for covering the bottom and sides of ships is made of one part of tallow, of one part of brimstone, and of three parts nearly of rosin. The tallow and rosin are melted together, and the brimstone is stirred into them; one hundred and forty pounds of brimstone will serve for a vessel of one hundred and forty tons. See *PAY*.

To prevent ships, whose bottoms are worm-eaten, from leaking, this method has been proposed. Caulk well the inside planks or linings, then fill the vacant spaces between the timbers, and the out and inside planks, with boiling pitch or rosin, so high as the main gun-deck. The pitch being

put in very hot, will run into the smallest cranny, and make the ship as tight as a bottle. There will be no room left for vermin, as rats, &c.; and the pitch will serve for other uses when taken out, therefore the expence will be but small. Phil. Trans. N^o 476. p. 372.

For the laws relating to ships, &c. see *AA of English NAVIGATION*. See also *FREIGHT, MARINERS, and NAVY*.

SHIP, *bulk, burden, captain, clerk, company, corporal, flag, grounding, master, mine, register, rigging, run, sheathing, squadron, stay, steward, warp, washing away, weather*, in reference to a ship, see the respective articles.

For further particulars respecting ships, the reader is referred to the article *SHIP-BUILDING*.

SHIP, *To*, in *Sea Language*, is used either actively, as to embark any person, or put any thing aboard ship; or passively, to receive any thing into a ship; as we shipped a heavy sea, &c.

To ship also implies to fix any thing in its place, as *to ship* the oars; *to ship* the fwivel guns, i. e. to fix them in their sockets, &c.

SHIP of Pleasure, among the *Ancients*. See *THALAMEGUS*.

SHIP, in the *Salt Works*, is a large cistern, out of which the salt-pans are supplied for boiling.

This cistern is built close to the saltern, and is made either of wood, brick, or clay; and it ought always to be covered with a shed, that the sea-water, contained in it, may be kept clean from foot, and other impurities, and not mixed with fresh water in rains; and it must be always placed so high, that the water may easily run out of it into the pans, to supply them for boiling.

SHIP Guns. See *CANNON*.

SHIP Cove, in *Geography*, a cove of Queen Charlotte's sound, in the southern island of New Zealand. This harbour, according to captain Cook, is not inferior to any found, either for convenience or safety. It lies on the west side of the island, and is the southernmost of three coves, that are situated within the island of Motuara, which bears east of it. Ship Cove may be entered either between Motuara and a long island called by the natives Hamote, or between Motuara and the western shore. In the last of these two channels are ledges of rocks, three fathoms under water, which may be easily known by the sea-weed that grows upon them. S. lat. 41° 10'. E. long. 175° 6'.

SHIP Island, a small island in the gulf of Mexico, near the coast of West Florida, nine miles long and two broad. It produces pine-trees and grafs, and has a tolerable well of water. N. lat. 30° 5'. W. long. 88° 48'.—Also, a small island of Upper Canada, in lake Erie.

SHIP Point, a cape on the coast of North Carolina. N. lat. 35° 59'. W. long. 76° 30'.

SHIP-BUILDING, or *Naval Architecture*, is the art of constructing and raising, or building that noble fabric called a ship.

This science, or whatever relates to navigation, is, without doubt, one of the most important and most useful employments of the human mind; especially in a country whose marine is its bulwark, and its commerce the admiration, and, we may add, the envy of the world.

Nevertheless, the scientific part of ship-building has been too much neglected; and although some few years have elapsed since mathematicians (particularly in France) have laboured with some success, yet their discoveries are so much enveloped in profound calculations, that ship-builders, in general, have scarcely been able to derive any advantage from them.

It must be allowed, that an exact knowledge of the true

SHIP-BUILDING.

true principles upon which the construction of ships, so as to answer the particular purposes of war or commerce, is founded, must conduce to remedy all the present defects, to render the theory more perfect, and enable the English artists to become as eminently skilful in the scientific, as they now confessedly are in the practical branches of ship-building.

In order to smooth the way in a science thought so incomprehensible, our readers must be made familiar with the several draughts and plans requisite to construct and raise so noble a body of architecture; for the proportional size of every part must be laid down, from whence the form and dimensions of the several timbers, and every particular part that enters into the construction, are to be obtained. Therefore, as a ship has length, breadth, and depth, three different plans at least are necessary to represent the form of the several parts of her; as in the sheer-draught, *Plate I.* of *Ship-building*, which comprehends the *sheer-plan*, the *body-plan*, and the *half-breadth plan*.

The *sheer-plan*, or, as it is called in civil architecture, the *plan of elevation*, is a vertical section, passing through the vessel in its whole length, or fore and aft. Upon this plan the length and depth of the keel are represented, also the height and rake of the stem and stern-post; the situation and height of the midship and other frames; the water-lines; heights of the decks, gun-ports, and wales; the centres of the masts; the situation of the channels; length and depth of the head and rails, quarter-galleries, rudder, &c. &c.

The *body-plan*, or *plan of projection*, to the left of the sheer-plan, is a transverse section of the ship at the midship-frame, or broadest place perpendicular to the keel. The several breadths, and the particular form of every frame-timber, are described on this plan. Now as the two sides of the ship are, or should be, exactly similar to each other, it is therefore unnecessary to represent both: hence the frames contained in the fore-body, between the midship-frame and the stem, are described on the right-hand side of the middle line, and the aftermost frames on the left of the said middle line.

The *half-breadth* or *floor-plan*, under the sheer-plan, and parallel thereto, or as it is frequently called, the *horizontal plan*, contains the several half-breadths at every frame-timber, at the different heights of the water-lines, main-breadth, top-side, ribband-lines, &c.

The consideration of these three principal plans is so much the more important, as it comprehends a sufficient knowledge of the figures of all vessels. For although these three plans do not really determine the figure of the vessel, and may belong to an infinity of different kinds, yet all these differences cannot exceed certain limits sufficiently confined; so that whatever idea we might form of the figure of the vessel, it cannot deviate considerably from the truth.

In order to explain this better, we will proceed to construct the sheer-draught, *Plate I.*; and here the nature, and all the properties of the vessel, according to her design for war or commerce, must be taken into consideration, upon which the whole theory of the art depends: such are, capacity, stability, velocity, and ease in the sea or at anchor. These properties are not to be adopted merely from speculative theory, but from those that have actually been demonstrated by repeated experiments. That our readers may have the clearest conception of the various parts of a ship, represented by the plates of the 74-gun ship, we will endeavour to describe them in as familiar a manner as possible, introducing also all that is necessary to be known as we proceed. The 74-gun ship is preferred as the medium

between the first-rate and the frigate, and is esteemed the most useful of all others.

Therefore, the first thing to be determined is the length on the gun-deck; and here sufficient distance must be allowed for the ports, which are fifteen in number, three feet five inches wide, or fore and aft, each, so as to have a sufficient distance between each port for working the guns, which is about seven feet eight inches; likewise room forward, between the foremost-port and the stem, for the manger; and also abaft the after-port, to the transoms: these considered make the length on the gun-deck 180 feet.

Draw therefore, as in sheer-plan, *Plate I.*, a straight line, which represents the upper edge of the keel, and in naval ships the upper edge of the rabbet (East India ships and merchant-ships in general have the rabbet in the middle of the keel), leaving under this line sufficient space for the main and false keels, scale, and half-breadth plan. Upon this line square up a perpendicular towards the right hand, leaving a sufficient space to represent the head, and call it the foremost-perpendicular; then, at $22\frac{1}{2}$ inches abaft it, square up the after-perpendicular, which is 180 feet, by one-eighth of an inch to a foot, or the length on the gun-deck, from the aft-side of the rabbet of the stem to the fore-side of the rabbet at the stern-post. Below the upper edge of the keel, and parallel thereto, set down two feet for the main and false keel, and under it draw the scale of equal parts, of one-eighth of an inch to a foot, and from this scale set off all the following dimensions. Observe, draughts in general are drawn from a scale of one quarter of an inch to a foot, but this, for convenience, to one-eighth.

The length between the foremost and aftermost perpendiculars, in merchant-ships, is given from the aft-side of the stern-post, at the height of the wing-transom, to the fore-side of the stem, at the same height.

The stem, or fore-boundary of the ship, may now be drawn, and a segment of a circle for its lower part has long been considered as the best form for dividing the fluid; therefore, fix its centre so that the aft-side of the rabbet (which is in the middle of the stem, towards the upper part) may intersect the foremost-perpendicular at the height of the gun-deck: thus, set aft from the foremost-perpendicular, as in *Plate I.* upon an horizontal line, 24 feet above the upper edge of the keel, 24 ft. 3 in.; and from thence, as the centre, draw an arc of a circle from the upper edge of the keel-line, and another arc 18 inches before it, from the same centre; then will the moulding, or fore and after-sides of the stem, be represented: sweep likewise the rabbet, as in *Plate I.*; then set up 36 feet for the height of the head of the stem, and at that height set forward 15 inches from the foremost-perpendicular; from thence draw a faint curve, to intersect with the foremost segment, and the fore-part of the stem will be shewn: continue upwards another parallel thereto, and the aft-side or whole stem is completed, except the lower end or boxing, which will be determined hereafter.

The stern-post, or after-boundary under water, may be next drawn; thus, set up from the upper edge of the keel-line 26 ft. 10 in., which is the upper side of the wing-transom at the after-perpendicular, and upon that line set aft from the perpendicular 1 ft. 10 in., and upon the upper edge of the keel, six inches before the after-perpendicular; then a line drawn through these points will represent the aft-side of the stern-post; another line, drawn at fourteen inches before the aft-side of the stern-post, at the wing-transom, and at two feet one inch on the upper edge of the keel, will be

SHIP-BUILDING.

the aft-side of the rabbet; and another line parallel four inches before it (or at the thickness of the bottom plank) is the fore-side of the rabbet, which will intersect the after-perpendicular at the gun-deck. Thus far the stern-post at present.

Having fixed on the length of the gun-deck, the next principal dimension to be considered is the main-breadth, and this, in ships of war in general, is about three-elevenths of the said length for their moulded breadth, and in merchant-ships about three-twelfths of their length; excepting cutters and smaller vessels. The moulded breadth given in *Plate I.* of the 74-gun ship, is 48 feet.

Before we proceed, it will be necessary here to remark, that much has been said in regard to the breadth to be given to a vessel in respect to her length, and in what part of that length it is best to place it; as being the section of the greatest area of the whole vessel, its true situation becomes an object of importance.

Those who would diminish the breadth have alleged, and truly, that a narrow vessel meets with less resistance in passing through the water, and by increasing in length, the vessel will drive less to leeward, and the water-lines consequently be more delicately formed to divide the fluid; that a long narrow ship will require less sail to gain velocity, consequently the masts will be lower, the rigging lighter, and the vessel navigated by fewer hands. On the contrary, a ship's being broader at the line of floatation will admit of being narrower on the floor, particularly at the fore and after parts; that by being broader it can carry more sail, and more readily rise upon the waves than a narrow one. The breadth, and its situation, when determined on, require much skill in narrowing therefrom, as we approach the keel, particularly forward and aft, to give that form to the body under water that shall best answer in dividing the fluid, enable her to carry the lower tier of guns sufficiently out of the water, prevent her pitching, and give a free passage to the rudder, that she may readily answer her helm.

Now to prevent the vessel pitching, the fore-body must be so shaped, that its bearings should catch the vessel in its descent, that is, the harpin should increase in breadth upwards, and the bow be so formed, as rather to throw off the sea than pitch or bury in it: a long floor, with little rising afore and abaft, the displacement of the fore-body to be duly proportioned to the after-body, and hollow water-lines, or inflected curves at the fore part, are to be carefully avoided. Taking into consideration the weight of the anchors on the bows, we may easily conceive, that with the pressure of the wind upon the sails, without sufficient bearing in the fore-body, the bow would be pressed down into the hollow of every sea; and if the greatest area or midship-bend were placed too far aft, the support would only be in the after-body, and this would tend to plunge her bows still deeper, and retard her velocity, and the free passage of the water to the rudder.

In order that the ship should steer well, and quickly answer her helm, the wing-transom must not be placed too low, nor the fashion-pieces too full below the load-water line; and the narrowing of the floor, or half-breadth of the rising, not continued too full towards aft, but that the water-lines, as they approach the stern-post, may taper handsomely into the same, so that every succeeding water-line, as they approach nearer the keel, may have their curvature more delicate, as may be seen by referring to the half breadth plan in *Plate I.* It is also evident, that the prompt effect of the rudder must depend in a great measure on the cleanness of the ship's run, so that the fluid shall have an unimpeded passage to it, whereby its inclination shall have the greatest effort from the water.

That a ship may carry her guns well above the water, a long floor timber will be necessary, and not much rising; the midship-frame should be very full, upper futtocks nearly straight, upper works very light, and kept as low as possible, and the wing-transom not placed too high.

To make a ship carry her guns well above water, carry much sail, be a fast sailer, and likewise steer well, are four such rare qualities, as are hardly to be united in the same vessel, because it would require a very full bottom and great breadth to gain the two former qualities, and less breadth and a sharp or clean bottom to gain the latter; but if we consider that a full ship will carry more sail than a sharp one, we may perceive the possibility of so constructing the body, as to possess these qualities, and they may be so united, that each of them may be discerned in some degree of eminence, for it is not possible that all of them can be united in one body to a degree of perfection; we must, therefore, while we retain a portion of each, give the superiority to that which is most consistent with the purposes for which the vessel is peculiarly designed.

Hence it is plain, that judiciously placing the midship-bend is of the utmost consequence in the construction of ships' bodies; and its being placed nearer forward, will, consequently, make the fore-body more full, and will best answer every purpose, especially that of velocity; and although it is plain, that by so doing the entrance of the ship will be more full, and present apparently more absolute force against the resisting medium, than when the midship-bend is placed nearer to the middle of the ship's length, yet by placing it more forward, the body will decline horizontally so much the quicker, and part of the effect of that resistance, caused by the lateral pressure of the water, will be lessened, which must certainly be of more service to the velocity, than what is lost by making the fore-part of the ship somewhat fuller, and this seems to promise the connection of capacity with velocity, the two great objects to be pursued in the formation of ships' bodies under water. In addition to this, by carrying the midship-bend forward, a ship will steer better, and the rudder have the more command to bear up the ship in a gale of wind; for when a ship is under a press of sail, the water is forced up at the bow above the horizontal, and the bow likewise pressed down, which amounts to nearly the same, with respect to her helm, as if the ship was trimmed by the head: again, ships that carry their helm amidships in light winds, require it more a-weather when the wind blows.

After all that has been written concerning the placing of the midship-bend, all agree to place it before the middle of the length, or about five-twelfths of the length abaft the foremost-perpendicular; but in *Plate I.* which ship has stood the test of experiment, it was placed at 69 feet abaft the foremost-perpendicular, consequently this is the broadest part of the ship, called the midships, or dead-flat, known by this character \oplus , and where all the heights in midships are set up. From \oplus the stations of all the timbers may be set off; but it will only be necessary to square up a perpendicular at the joint of every frame-timber, their distance being double that of the room and space, which in *Plate I.* is two feet nine inches.

The dead-flat in *Plate I.* is a single timber, and the perpendicular, marked \oplus , the middle of it: therefore, for the joints of the annexed frames set off before \oplus , two feet nine inches for the joint of (A), and two feet nine inches abaft \oplus for the joint of (1), square up perpendiculars from the upper edge of the keel; then from (A) continue setting off five feet six inches for the joints of frame B, C, D, to X, in the fore-body, and the same distance abaft (1) for the joints of

SHIP-BUILDING.

frame (3), 2, 4, 6, to 36 in the after-body, as shewn in *Plate I.* Now \oplus , (A), (1), (2), and (3), are called flats, as they are the timbers which are placed in the flat part of the ship amidships, have no bevellings, and consequently do not partake of the rising.

The lower height of breadth is an imaginary line, not only to assist in the construction of the body, but a line confining the greatest breadths in the ship, all fore and aft, and should next be determined upon. Its height at \oplus is 21 feet 3 inches above the upper edge of the keel; and that the said height of breadth should be higher afore and abaft is only reasonable as a reserve, to be a support to the vessel when heeling by the pressure of the wind upon the sails; for when a ship is close-hauled by the wind, and lies much over, the weather-side would lose much of the breadth, whereas, on the contrary, the lee-side would then gain considerably, and meeting with a greater resistance, be enabled to carry the greater sail; therefore forward at the rabbet of the stem its height is 29 feet, and abaft at the counter-timber 29 feet 6 inches; and all the heights between should form a fair curve, like the ticked line in the sheer-draught, *Plate I.*

It may here be remarked, that flat-floored ships do not require their height of breadth to be raised so high forward and aft, for by their construction they are stiffer under sail, and carry their weight of cargo low down.

The body below the lower height of breadth may now be formed, as the frames or bends, when put together, and the joint placed to the fore-mentioned perpendiculars, the sides of every port will be formed so as to cut none of the principal timbers, and are so disposed as to weaken the ship as little as possible. Now as capacity, velocity, &c. depend upon the figure of the immerfed part of the body, and because the properties which every ship ought to possess are, in a manner, subversive of, or in opposition to, each other, as before observed, the great art certainly is so to form the body, that none of the desired qualities shall be omitted, giving, at the same time, preference to that which is most required. In ships of war, capacity, stability, velocity, and strength, are essentially necessary; the first and second we shall endeavour to prove by calculations hereafter; the third may be affirmed, as the vessel was actually built, and answered that purpose; and the last is now so well established in the British navy as to need little addition.

The half-breadth plan must be next drawn: thus, draw a straight line below the sheer-plan, as in *Plate I.*, the whole length of the ship, and parallel to the upper edge of the keel, which line will represent the middle line of the ship, at any height passing fore and aft, or lengthwise; observing to keep the said middle line sufficiently below the scale, so as to admit of the main half-breadth line coming clear of it.

Then square down from the sheer-plan all the perpendiculars or joints of the frame-timbers, to the middle line of the half-breadth plan, and likewise the foremoft and after-perpendicular. The main half-breadth line may now be drawn, by setting-off from the middle line in the plan the following half-breadths at each respective timber; thus, at \oplus , 24 feet; at F, 23 feet 11½ inches; at H, 23 feet 11 inches; at K, 23 feet 10 inches; at M, 23 feet 5½ inches; at O, 23 feet; at Q, 22 feet 2 inches; at S, 20 feet 4 inches; at U, 17 feet 6 inches; at X, 12 feet 6 inches; and to end this line at the fore part, let the height of the breadth-line in the sheer-plan, where it intersects the aft-side of the rabbet at the stem, be squared down to the middle line in the half-breadth plan, and likewise the fore part of the stem: upon the lines last squared down, set off the half-rising of the stem from

the middle line and parallel thereto, which is ten inches; then, with compasses, take the thickness of the bottom plank, which is four inches, and describe the rabbet of the stem by the triangle shewn in the half-breadth plan; from thence a fair curve line drawn through the half-breadths set off, forms the half-breadth line to \oplus . In the same manner set off the half-breadths abaft \oplus , and draw in the remainder of the half-breadth line, as the ending of it abaft will be described hereafter.

Observe, the various curves represented on the several plans used in ship-building, except where they are segments of circles, such as the fore part of the main half-breadth, &c. are drawn by small pliable battens confined thereto by weights, or by thin moulds made of pear tree veneers, whose edges are made to geometrical curves of all kinds.

Now the main half-breadth line being drawn, we have a half section of the ship lengthwise at the broadest place, that is at the height, and in the direction of the lower height of breadth line in the sheer-plan, *Plate I.*

The immerfed part, or body of the ship under water, must be next formed, and the capacity of the vessel ascertained, before the upper works, or that above the water, need come under consideration; it is therefore necessary to describe in what manner the several forms of ships' bodies are to be constructed. In the royal navy, the midship parts of the body of ships are formed by segments of circles called sweeps; such are the lower and upper breadth-sweeps, floor-sweep, and reconciling-sweep, their several centres being given by lines, except the reconciling-sweep, whose centre is without the limits of the draught. The lower-breadth and floor-sweeps are joined by the reconciling-sweep, and make a fair curve from the lower height of breadth to the rising-line, by which the floor-sweep is governed; then, by drawing a straight or curving line from the upper edge of the rabbet of the keel to touch the back of the floor-sweep, the form of the midship part of the body below the lower height of breadth will be complete.

Observe, the floor-sweep forms the body at the floor-heads, particularly along the midship part of the body, and is limited by an horizontal line above the keel in the body-plan, and its distance above the keel at the midship-timber is called the dead-rising. The rising of the floor in the sheer-plan is a curve line intersecting the dead-rising at the midships; and in flat-floored, or burthened ships, it continues nearly parallel with the keel for some distance afore and abaft the midship-timber; and all the timbers, where the rising is parallel with the keel, are called flats, as before observed. The rising-line, which governs the floor-sweeps, is not the least interesting of the series, because it exhibits, on many points, general deductions, and tends to establish theories which may serve to direct future observations; and the method of constructing the midship-floors of ships, where velocity is preferred, by lengthening the radii of the floor-sweep forward and aft, is preferable to the rising-line, as used in constructing merchant-ships for burden, where the radii of the floor-sweeps all fore and aft are of the same length as at the midship-timber; because by the former method, every floor-timber from the dead-flat is graduated by a larger circle. By the latter method, not only the construction, but the laying-off the ship is facilitated, because in any ship constructed by the same length of radii, we may venture, so far as the rising-line is continued, not only to form all the lower part of the ship on the draught, but also on the mould-loft-floor, without running any ribband or horizontal lines till that part is finished. Again, this method affords a greater assistance, as by it the floors may be constructed all fore and aft; but the floors near the midships only can be constructed,

SHIP-BUILDING.

constructed, when the radii of the floor-sweeps alter much in their length.

Neither the rising-line in the sheer-plan, nor the half-breadth of the rising, would continue to be the curves as first constructed, if the form of the body first designed were to be altered in that part. It is evident, then, that the rising-line may be drawn according to the judgment of the artist in the construction of any draught, observing to make it a fair elliptical curve, (for much depends on the construction of the lower part of the body,) by judiciously narrowing the floor-sweep, or half-breadth of the rising; for the more parallel it is kept with the middle line, the less will be the velocity of the ship. Again, the quicker this curve is, the less bearing will the ship have; and though it may be supposed, when the rising-line is formed in the sheer-plan, and likewise its half-breadth, it is reasonable to expect a fair body, yet we cannot be certain of its producing that form of body which is really intended agreeable to the use which the ship is designed for, unless by frequently designing of bodies we can form an exact idea before we proceed. Therefore the young artist should improve himself by drawing bodies constructed by the rising-line of ships of different properties, till he forms in his own judgment a perfect idea of this mode of construction. For instance, if it be required to make the ship cleaner, lift the rising-line in the sheer-plan, and narrow its half-breadth; and where it may be required to make the ship fuller, lower the rising-line in the sheer-plan, and increase its half-breadth; which sufficiently proves that the rising-line is as variable as the different forms of ships' bodies may require. See for fulness the plate of the East India ship, the plate of the 74-gun ship, which is sharper, and also the frigate of 40 guns, which is sharper still; and we shall then find it a very complete method of constructing the lower parts of such ships fair, particularly those that require some provision or fulness of body to assist them in taking the ground. The further forward and aft the body is assisted by the rising-line, the more merit there will be in the construction, and the greater certainty of producing a fair body: notwithstanding all this, some bodies are constructed without any floor-sweeps, which must be the case in very sharp bodies, such as cutters, &c.

It may be further observed, that the rising-line cannot, from its nature, be formed by any regular proportional method, from which there can be no variation without impropriety; nor can it be constructed to any fixed proportion, unless ships of different classes were built exactly similar to each other, because the rising-line in ships of war, and those which are constructed for velocity, though suitable to the construction of the lower part of each ship, and likely to answer the purpose for which they are designed, cannot be equally proper for ships of the same length and breadth, if required chiefly for burden; as in the last case not only the form of the midship-bend, but every part of the bottom must be differently formed, which will be clearly seen by examining the plates of the 74 and 40-gun ships, and the plate of the East India ship, which was found to answer admirably well.

Whole-moulding was formerly a method of constructing the immersed part of ships' bodies, by the mould being made to the form of the midship-bend, which, with the addition of the floor-hollow, would mould all the timbers below the main-breadth in the square body. But since the art of ship-building has arrived to its present perfection, the method of whole-moulding, for the following reasons, has been justly laid aside. For by whole-moulding, no more is narrowed at the floor than at the main-breadth, that is to say, the curves of each are kept parallel; nor must the rising-line in the

sheer-plan lift any more than the lower height of breadth; which, according to the form of some midship-bends, would make a very ill-constructed body; for by continuing that nearly forward and aft, the ship would not only be incapable of rising in a heavy sea, but be deprived in a great measure of the more advantageous use of her rudder. Nevertheless this method is still continued in the formation of boats.

Proceed now to draw the plan of projection, or body-plan, thus: continue the line at the upper edge of the keel beyond the after-end of the sheer-plan, as in *Plate I.*, and square up a perpendicular for the side-line of the fore-body, observing to keep it clear of the stern; from that perpendicular set off 48 feet, the ship's main breadth at dead-flat, and square up another perpendicular for the side-line of the after-body, and equally between both square up another perpendicular, which is the middle line to both bodies respectively; then the line prolonged from the upper edge of the keel is the base line of the body-plan. Draw in the horizontal lines, as may be seen in the body-plan, *Plate I.* at the lower heights of breadth, by transferring their heights from the sheer-plan at the several frame-timbers: those before the dead-flat, set up in the body-plan to the right of the middle line, which are to represent the fore-body, and those heights abaft dead-flat, to the left hand for the after-body. Then from the half-breadth plan take the main half-breadth of each frame, and set it off from the middle line in the body-plan, upon its corresponding height of breadth-line; and from thence set off towards the middle line the length of their respective lower-breadth sweeps: thus, to describe the midship-timber, or dead-flat, extend the compasses to 18 feet 6 inches, the radii of lower-breadth sweeps at dead-flat, and draw part of a circle downwards, intersecting its main breadth at its horizontal height.

Then the centre heights of the floor-sweeps in the body-plan must be taken from the curve-line representing their heights in the sheer-plan, which at dead-flat will be found to intersect the upper edge of the keel; but in the body-plan, its height at dead-flat is 11 feet 6 inches, and there an horizontal line is drawn to the distance of the centre, or its half-breadth from the middle line, and all the heights of centres are respectively set upwards above this line, on perpendiculars squared upwards at the half-breadth of the centre of each floor-sweep of its corresponding frame or timber, as taken from the half-breadth plan; and the reason for not keeping the said curve-line or heights in the sheer-plan as in the body-plan, is because it would interfere with the curve-lines above. Now by inspecting *Plate I.* it will be readily seen, that by raising the heights of those centres in the sheer-plan, consequently in the body-plan, and by narrowing their half-breadths in the half-breadth plan, their centres would be brought nearer the middle line in the body-plan, the floor-rising would become quicker, and the ship have less bearing, and *vice versa*, more full and burthened: thus must the rising and narrowing of the centres be adjusted till the body of the vessel has the capacity required for whatever service she may be designed.

But as in this mode of construction the centres only, and not the length of the floor-sweeps, are given, a diagonal rib-band must be drawn in the half-breadth plan, as in *Plate I.*, by setting off from the middle line at \oplus , 16 feet; at B, 15 feet 9 inches; at D, 15 feet 5 inches; at F, 15 feet 1 inch; at H, 14 feet 7 inches; at K, 14 feet; at M, 13 feet $\frac{1}{2}$ an inch; at O, 11 feet 11 inches; at Q, 10 feet 4 inches; at S, 8 feet 6 inches; at U, 6 feet 1 inch; and at X, 2 feet 5 inches. Then in the after-body set off at 2, 15 feet 11 $\frac{1}{2}$ inches; at 4, 15 feet 10 $\frac{1}{2}$ inches; at 6, 15 feet 9 inches; at 8, 15 feet 6 inches; at 10, 15 feet 4 inches; at 12, 15 feet 1 inch; at 14, 14 feet

SHIP-BUILDING.

14 feet 11 inches; at 16, 14 feet 5 inches; at 18, 14 feet; at 20, 13 feet $3\frac{1}{2}$ inches; at 22, 12 feet 5 inches; at 24, 11 feet 7 inches; at 26, 10 feet 5 inches; at 28, 9 feet 1 inch; at 30, 6 feet 7 inches; at 32, 5 feet 10 inches; at 34, 4 feet; and at 36, 2 feet.

Now to end this diagonal, it must be drawn in the body-plan thus; set up the middle line from the base 12 feet 2 inches, and on the base, from each side of the middle line, 11 feet 9 inches, then draw the diagonal ticked line, as shewn in *Plate I*. In draughts, diagonal lines are distinguished by red ink. Then in the body-plan draw the half-finding of the stem in the fore-body, and the half-finding of the stern-post in the after-body: for the latter set up 26 feet above the base, and at that height set off from the middle line 10 inches in the half-finding of the post at the head, and 9 inches in the fore-body, the half-finding of the stem at that height; and on the base line $7\frac{1}{2}$ inches from each side the middle line, the half-finding of post and stem at the heel; then draw straight lines to each spot set off, and the half-finding of the stern-post and stem will be represented in the body-plan. Now to complete or end the diagonal line on the half-breadth plan, its height or intersection at the post and stem must be taken in the body-plan, and transferred respectively to the fore-side of the rabbet of the stem, and aft-side of the rabbet of the post in the sheer-plan, and from thence let them be squared down to the middle line of the half-breadth plan; then take with compasses the half thickness of the post and stem in the body-plan, in the direction of the said diagonal line, and set them off respectively from the middle line in the half-breadth plan, on the lines last squared down; and from the intersection as a centre, sweep an arc towards the midships, with compasses opened to the thickness of the rabbet taken diagonally; then a fair curve drawn through all the spots as above set off, touching the back of the arcs, will form the diagonal line at the floor-heads, as shewn in the half-breadth plan, *Plate I*.

Now may the timbers, as far as the floor-sweeps are useful, be completed in the body-plan below the lower height of breadth, beginning at dead-flat: thus, take the half-breadth of the floor diagonal at \oplus in the half-breadth plan, and set it down the diagonal from the middle line in the body-plan; then take the half-breadth of the floor-sweeps in like manner, and set it off from the middle line in the body-plan on the horizontal line before drawn at its height, and from the intersection extend the compasses to the half-breadth of the floor diagonal, and sweep an arc upwards from the dead-rising, which is six inches at \oplus ; then with the reconciling-sweep, which is of a long radius compared with the others, unite the lower-breadth sweep and floor-sweep together; for the more the midship-frames deviate from the segment of a circle, the less will be the rolling motion of the ship; unite the floor-sweep with the upper edge of the rabbet of the keel with a curve or straight line, and the midship-timber will be formed below the lower breadth. In the same manner may be formed the frame-timbers B, D, F, H, and K, in the fore-body, and 2, 4, 6, 8, 10, to 24 in the after-body, by setting off the half-breadth of each frame's diagonal as at \oplus , their corresponding heights of breadths, main half-breadths, and centres of each sweep, as before directed, and by reconciling the lower-breadth sweeps and floor-sweeps together, and ending them into the rabbet at the keel; thus the midship part of the body will be formed from K forward to 24 abaft.

Hence it may be readily conceived, that bodies full or sharp, either for burthen or velocity, may be constructed by altering the radii of the different sweeps; and unless bodies of ships could be constructed from some geometrical

figure, a more certain method than the above cannot be given.

The body being thus far formed, that is from K forward to 24 abaft, proceed to prove it by horizontal lines, and finish the remaining part forward and aft. These lines are generally called water-lines, as the ship's bottom at the surface of the water, supposing the keel kept parallel thereto, would be of the same figure as those lines represented in the half-breadth plan, with the addition of the thickness of the bottom plank in that direction. The upper one is called the load-water-line, or line of floatation, when the vessel is supposed fit for sea, which will be treated of more particularly hereafter; the other water-lines may be equally divided between the upper or load-water-line, and upper edge of the keel or rabbet. Although a ship may draw more water abaft than forward for her best sailing trim, yet to keep the several water-lines horizontal, or parallel with the upper edge of the keel, is the most useful in construction; and the water-lines, as represented in the half-breadth plan, form curves, limiting the various half-breadths of the ship at the heights of their corresponding lines in the body-plan. They are generally drawn with green ink, but in *Plate I*. with corresponding dotted lines, and are represented by straight lines in the sheer-plan; and if parallel with the keel they will be horizontal lines in the body-plan, but if the vessel is to be constructed to draw much more water aft than forward, the water-lines will not of course be parallel with the upper edge of the keel; then, owing to their various heights at each timber in the sheer-plan, they will form curves at those heights in the body-plan, and the more they vary from an horizontal line, the less accurate will the limits of their half-breadths be described in the half-breadth plan.

In *Plate I*. the upper horizontal water-line is 20 feet above the lower edge of the keel; and between that and the upper edge of the rabbet of the keel, are equally divided four more water-lines, as in the sheer-plan. The water-lines may now be drawn in the half-breadth plan from the body-plan, as far as the timbers are there formed; thus, continue the water-lines aft from the sheer-plan across the body-plan, then take off with compasses, or a slip of paper and pencil, their various half-breadths from the middle line, to the places where the several timbers intersect each water-line, and set them off on their corresponding timbers from the middle line in the half-breadth plan; then to end each water-line square down where they intersect the fore-part of the rabbet at the stem, and aft-part of the rabbet at the stern-post in the sheer-plan to the middle line of the half-breadth plan; then take the half-finding of the stem and the stern-post at each water-line from the middle line in the body-plan, and set them respectively on the lines last squared down from the middle line in the half-breadth plan; from thence, as the centre, with compasses opened to the thickness of the bottom plank, make a sweep, the back of which is the ending of the line. Then complete the fore and after ends of each water-line with curves, as in the half-breadth plan, avoiding all inflected curves or hollow water-lines at the fore part, as they may be drawn by arcs of circles, although their centres may be without the limits of the plates of ship-building.

Now the whole of the body may be completed under the lower height of breadth, observing to sweep each timber below its height of breadth, as before directed; then by taking off the half-breadth of each timber, where they intersect the water-lines from the middle line in the half-breadth plan, and setting them off on their corresponding water-lines from the middle line in the body-plan, curves passing through those spots will shape the timber; but to end them into the rabbet, or complete the heeling, the keel must

SHIP-BUILDING.

must be drawn in the body-plan; thus, set off nine inches on the base line from each side of the middle line, being the half-siding of the keel, and also 18 inches below the base line, which squared will represent the thwartship section of the keel in midships: then, with compasses opened to the thickness of the bottom plank, fix one leg where the keel intersects the base line, which is the upper side of the rabbet, and sweep an arc within the keel to intersect the side, and from that intersection sweep another arc upwards; then a triangle drawn within those arcs, represents the rabbet of the keel in midships, and all the timbers along the midships, until the rabbet opens, end where the rabbet intersects the base line; but when the rabbet opens by the timbers rising forward and aft, they will end over the back of the sweep to the inner edge of the rabbet. The timbers near the after-end of the keel must be ended agreeably to the tapering of the keel, which tapers in the siding from frame 24 to 15 inches at the after-end: this must be set off from the middle line in the half-breadth plan, and the half-siding of the keel taken at each timber, and set off on the upper edge of the keel from the middle line in the body-plan; then set within the half-siding of the keel the thickness of the bottom plank, and that ends the timber. But as the frames in the fore-body before O heel upon the stem, their heights must be taken in the sheer-plan, where they intersect the lower part of the rabbet, and those heights set up in the body-plan upon the half-thickness of the stem; then with compasses opened to the thickness of the bottom plank, fix one leg in the heights last set off, and sweep a circle within the siding, and the heel passes over the back of the circle, and the rabbet completed by a square applied to the line of the timber, so as to intersect the height set up, as shewn in the plan of the fore-body, *Plate I.*

Now, as a further proof of the correctness of the after-body, draw four or five perpendicular sections, or, as they are commonly called, buttock-lines; but first prove the heels of the after-timbers by the bearding-line, thus; represent the half-thickness of the dead or rising wood in the body-plan, by drawing a perpendicular from the base line to the head of the stern-post. Then from the base line take the heights where the after-timbers cross the half-thickness of the dead wood, and set them up from the upper edge of the rabbet on their corresponding timbers in the sheer-plan; then draw a curve through those heights, to break in fair with the fore-side of the rabbet on the stern-post, and this curve will represent the bearding-line in the sheer-plan, and limits the heels of the after-timbers, as far as they cut off or lay against the dead-wood.

The heels of the timbers being found to agree with the bearding-line, from the fairness of its curve (observe, the term *fair*, so often used in the delineation of the several plans of a ship, signifies that the variety of curved lines therein used have no inequalities in them, but are even as a circle struck from its centre, as most of the lines in the formation of ships' bodies are curves, but many of their centres are too distant for application; and the fairness required is, that where every different curve unites no angle may be discoverable), proceed to prove the after-timbers by the buttock-lines; thus, square up from the base line in the after-body plan five perpendiculars, equally divided between the outside of the wing-transom, and the half-thickness of the dead-wood; that is, the outer buttock-line at 15 feet 10 inches, and the intermediate four at 3 feet 2 inches asunder.

Then take the heights at the first buttock-line, or that next the post, at the intersection of each timber from the base line in the after-body, and set them up from the upper edge of the rabbet on the corresponding timbers in the sheer-

plan; and to end the buttock-lines, the upper side of the wing-transom and margin-line must be drawn in the several plans; thus, set up 26 feet 10 inches for the height of the upper side of the wing-transom in the sheer and body-plans, drawing a horizontal line at the stern-post and across the body-plan; then from the middle line set off 16 feet 6 inches, the half-breadth of the wing-transom, and at that place set down, below the upper side of the wing-transom, six inches, and sweep the arc, whose centre will be in the middle line; and the round-up of the upper side of the wing-transom will be represented as in the body-plan, *Plate I.*; from the same centre sweep another arc six inches below the upper side of the wing-transom, which is called the margin-line. Then, in the half-breadth plan, sweep in the round aft or aft-side of the wing-transom; thus, square down from the sheer-plan the fore-side of the rabbet of the stern-post, where it cuts the upper side of the wing-transom, to the half-breadth plan, and upon the line so squared down, set off the half-breadth of the wing-transom from the middle line, and at that place set forward seven inches, and sweep the arc representing the round aft of the wing-transom, the centre of which is in the middle line.

Draw an horizontal line at six inches below the upper side of the wing-transom in the sheer-plan, and upon it square up the round forward of the wing-transom from the half-breadth plan; and from thence draw a line to the upper side of the wing-transom at the rabbet of the post, and the upper side of the wing-transom will be shewn, both to its round down and forward in the sheer-plan. Transfer the height of the margin-line from the body to the sheer-plan, and there draw a line parallel to the upper side of the wing-transom last drawn, and unite them at the fore part of the wing-transom by a line parallel to the rabbet of the post. The margin-line must next be shewn in the half-breadth plan, by squaring it down from the sheer-plan, and making it a parallel curve to the aft-side of the wing-transom; the distance, however small, being equal to the rake of the rabbet of the post, in the depth of the margin at the aft-side of the wing-transom. The margin-line being drawn in every plan of *Plate I.* proceed to end the buttock-lines in the sheer-plan; thus, take the distance of the buttock-lines square from the middle line of the body-plan, and set them off the same from the middle line in the half-breadth plan, drawing lines parallel thereto from the aft-side of the wing-transom to the after square timber, which will represent the buttock-lines in the half-breadth plan: then, where those lines intersect the margin-line in the half-breadth plan, square up spots to the margin-line in the sheer-plan, which spots will give the true ending of the buttock-lines, also square up the intersection of the buttock-lines with the water-lines from the half-breadth to the sheer-plan; then transfer all the heights of the buttock-lines, where the timbers cross them in the body-plan, to the sheer-plan, as before directed, and draw fair curves through all the spots set off to the endings, and the after part of the ship will be represented in the sheer-plan, as cut by those perpendicular sections, as in *Plate I.*

Now if the buttock-lines make fair curves, the after-timbers will be proved correct, and likewise the water-lines abaft in the half-breadth plan; but if the buttock-lines to be made fair curves deviate from the spots as set off, then must the timbers be altered accordingly, and consequently the water-lines. But as a further proof as to the correctness of the buttock, or that part of the body close aft, square up one or two imaginary or proof-timbers, equally between the after frame-timber 37 and the wing-transom at the side, as represented by the ticked lines in the sheer-plan, *Plate I.* Then take the heights on a perpendicular from the upper edge of the keel in the sheer-plan, where the

proof-

SHIP-BUILDING.

proof-timbers intersect the buttock-lines and bearding-line, and transfer them to the body-plan above the base line upon each corresponding buttock-line, and half-thickness of the dead-wood; take also the half-breadth of the proof-timbers where they intersect the water-lines in the half-breadth plan, and transfer them to their respective water-lines in the body-plan; but though the proof-timbers cross the stern-post, their heels may be set off, as before directed for the after-timbers; then if the spots so set off produce fair curves, as the ticked timber shewn in the body-plan, *Plate I.*, we may conclude that the after-body is sufficiently proved and its fairness accurate. The fore-body may be proved by vertical sections, in a similar manner as described above, only their ending will be determined by squaring up their intersections with the main-breadth line, from the half-breadth plan to the sheer-plan.

Having completed the form of the body thus far, it will be necessary to ascertain the capacity and stability of the part immersed, as in all ships of war there is a fixed height for the lower sill of the midship port above the load-water-line, allowing for six months' stores, provisions, &c. to be on board; and the capacity should be simply adequate for this purpose; for the nearer this is approached unto, the more merit is due to the constructor: it should not be more, to avoid superfluous expence in the building, and the additional men required to navigate her; nor should it be less, from an obvious general insufficiency to answer the required purposes: the bias should rather lead to increase than diminish in capacity. In ships for commerce, an exact estimation of their capacity is more frequently required to regulate the port duties, and the contracts between merchant owners and builders, than to insure their stability, a fixed line of floatation, and fast sailing, as the charge may be regulated by their ability to support it, and their load-water-line may be considerably varied, without any hurtful interference with other essential qualities.

Let us at present suppose the 74-gun ship, *Plate I.* as floating upon the water in equilibrium, and the upper water-line upon a level with the surface of the water, by which the ship is divided into two parts, the one above and the other under the water, which we call the immersed part of the body. In order to judge of this state of equilibrium, in which we suppose the vessel to be, it is necessary to take into consideration all the forces which act upon the vessel: and first the weight of the whole vessel presents itself, by which it is pressed down vertically in a line passing through the centre of gravity of the vessel. This force must therefore be counterbalanced by all the efforts which the water exerts upon the surface of the immersed part, and consequently it will be necessary to determine the pressure that each particle of the immersed surface sustains from the water, which requires researches very embarrassing, and a long series of calculations: but the following considerations will easily lead us to the desired end.

As the vessel occupies in the water, by its immersed part, the cavity formed by the body under the upper water-line, let us compare this case with another, the above cavity being filled with water: it is at first evident, that this mass of water will be in a perfect equilibrium with the water that surrounds it; and it is also plain, that this mass sustains from the part of the surrounding water, the same efforts which the vessel suffers from it. From whence we see, that these efforts of the water balance the weight of the mass of water which we have just substituted in the place of the vessel. Therefore, since these same efforts sustain also the weight of the whole vessel, it follows that this weight is precisely equal to the weight of the mass of water which fills the same cavity as formed by the body of the vessel

under the upper water-line; or rather, whose volume is equal to the volume of the immersed part of the vessel.

Here, therefore, is the first great principle upon which is founded the theory of the floating of bodies that swim upon the water. It is, that the immersed part must always be equal in volume to a mass of water, which would have the same weight as that of the vessel: and it is from this principle that we determine the true weight of a vessel, by measuring the volume of its immersed part in the water; for then, by reckoning 64,375 lbs. avoirdupois for each cubic foot, we shall find the weight of the vessel expressed in pounds.

However, this principle, only, is not sufficient to determine the state of the equilibrium of the vessel; another must be still joined to it, and which we shall find with the same facility. We have only to consider in *Plate I.* the centre of gravity of the mass of water under the upper water-line; then we shall easily conceive that all the efforts of the surrounding water are in equilibrium with a force equal to the weight of the mass of water displaced by the bottom under the upper water-line, which should act in a perpendicular direction through the centre of gravity of the said mass of water downwards: therefore, in order that the vessel may be in equilibrium with the same efforts, it is necessary that the centre of gravity of the vessel be in the same vertical line in which the centre of gravity of the immersed part is found. For that purpose we have only to mark within the vessel the very point where the centre of gravity of the immersed part would be, if it was composed of an homogeneous matter, and this point we shall term the centre of cavity.

Now the state of the equilibrium of any vessel will be determined from these two principles: 1st, that the immersed part must be equal in volume to a mass of water, whose weight would be equal to that of the vessel; and, 2dly, that the centre of gravity of the vessel, and the centre of cavity, fall in the same vertical line, which is the vertical axis of the vessel. With respect to the centre of cavity, it is evident that it must always fall below the load-water-line; and if the immersed part should preserve, in descending, every where the same surface, or that it had either a prismatic or cylindrical figure, then the centre of cavity would fall in the middle of the vertical axis between the load-water-line and the keel. But if the extent diminished uniformly from the load-water-line to the keel, and it at last terminated in a right line drawn through the keel, equal and parallel to the load-water-line, then the elevation of the centre of cavity would be two-thirds of the immersed part above the keel; and if the same immersed part should terminate in a point at the keel as a pyramid reversed, then the centre of cavity would be three-fourths of the immersed part above the keel; but with respect to the centre of gravity of the vessel, it may fall either above or below the load-water-line, according as the lading should be distributed throughout the body of the vessel. Thus in *Plate I.* of ships of war in general, where the guns constitute a considerable part of the weight, since they are placed above the water, the centre of gravity will be situated above its surface.

The bottoms, or immersed parts of vessels in general not strictly agreeing with any of the above-mentioned geometrical forms, it will be necessary to gauge the form of the immersed part of the vessel's bottom, or, which is the same thing, the quantity of water displaced by the bottom; the weight of which, as before observed, is equal to the weight of the ship, its rigging, provisions, and every thing on board. If, therefore, the exact weight of the ship when ready for sea be calculated, and also the number of cubic feet of water displaced by the ship's bottom below the load-water-line, it will then be known if the load-water-line is properly placed

SHIP-BUILDING.

placed on the draught. However operose and difficult the calculations necessary to ascertain the capacity, stability, &c. of ships may be, it must be allowed that it will require the utmost care in the execution, to find the exact dimensions of the several sections of the ship from the draught, (especially as every dimension in the ship is forty-eight times bigger than their similar ones on the draught, supposing it to be drawn by a quarter of an inch scale to a foot), as an error of a quarter of an inch in the draught, which is only the forty-eighth part of a real inch in the ship, will occasion an error of 110,592 cubic quarters of an inch in the ship,

provided the error be in all the three dimensions, viz. length, breadth, and depth. Great precision, indeed, must be used to measure to a quarter of an inch in *Plate I.*, seeing it is only drawn, for convenience, to an eighth of an inch scale. But as these calculations cannot be made with too great an exactness, the body had better be expanded on the mould-loft floor to the full size, and then the various dimensions may be taken very accurately.

The estimated weight of a 74-gun ship, as fitted for sea, with six months' provisions on board, is given in the following table.

An Estimate of the Weight of the 74-Gun Ship, *Plate I.*, as fitted for Sea, with Six Months' Provisions, Guns, &c.

Weight of the Hull.							Feet.	Tons.	Pounds.		
Oak timber, at 57.8125 lbs. to the cubical foot	-	-	-	-	-	-	47859	1236	208		
Elm timber, at 37.5 to the cubical foot	-	-	-	-	-	-	462	7	1645		
Fir timber, at 34.25 to the cubical foot	-	-	-	-	-	-	4397	67	517		
Copper bolts, rudder, braces, &c. &c.	-	-	-	-	-	-		20	1748		
Iron knees, bolts, nails, &c. &c.	-	-	-	-	-	-		28	2070		
Lead-work	-	-	-	-	-	-		2	160		
Pitch, tar, oakum, paint, &c. &c.	-	-	-	-	-	-		13			
Fire-hearth in galleys, &c. &c.	-	-	-	-	-	-		2	330		
Copper-sheathing of	{ 32 Ounces, N ^o 1000, weight 85 0 28 Ounces, 1820, 134 56 18 Ounces, 83, 5 80 Sheathing-nails - 21 32 }						=	-	-	12	728
										1390	686
Weight of the Furniture.											
Complete set of masts, yards, booms, &c. with the spare gear	-	-	-	-	-	-	-	70	1820		
rigging	-	-	-	-	-	-	-	30	1120		
fails with spare	-	-	-	-	-	-	-	13	1828		
Cables, hawfers, &c.	-	-	-	-	-	-	-	32	1120		
Anchors, with their stocks, &c.	-	-	-	-	-	-	-	17	584		
Blocks, pumps, and boats	-	-	-	-	-	-	-	27	560		
Weight of the Guns and Ammunition.										192	312
Guns, with their carriages	-	-	-	-	-	-	-	155	1557		
Powder and balls, powder-barrels, &c.	-	-	-	-	-	-	-	48	76		
Implements for the guns, powder, &c.	-	-	-	-	-	-	-	7	2034		
Weight of the Officers' Stores.										211	1427
Carpenter, gunner, and boatswain's stores	-	-	-	-	-	-	-	21	560		
Weight of the Men, &c.											
600 men, including the officers and their effects	-	-	-	-	-	-	-	95			
Ballast, iron and shingle	-	-	-	-	-	-	-	300			
Weight of the Provisions.										395	
Provisions for six months for 600 men, water, casks, &c. &c.	-	-	-	-	-	-	-	600			
RECAPITULATION.											
The hull	-	-	-	-	-	-	-	1390	686		
The furniture	-	-	-	-	-	-	-	192	312		
Guns and ammunition	-	-	-	-	-	-	-	211	1427		
Officers' stores	-	-	-	-	-	-	-	21	560		
Men and ballast	-	-	-	-	-	-	-	395			
Provisions	-	-	-	-	-	-	-	600			
Total weight										2810	745

SHIP-BUILDING.

By the preceding estimate, we find the 74-gun ship, *Pl. I.* weighs, when brought down to her load-water-line, 2810 tons 745 pounds, that is to say, when fitted for sea, with six months' provisions on board. It may now be known, with some degree of certainty, if the upper water-line on the sheer-draught, *Plate I.*, be properly placed, only by reducing the immerfed part of the bottom into cubic feet; for, if the 74-gun ship, when brought down to the load-water-line, weighs 2810 tons 745 pounds, the quantity of water displaced must also be 2810 tons 745 pounds, or 6,295,145 pounds. Now a cubic foot of salt-water being supposed to weigh 64,375 pounds, we shall therefore find, that if we divide 6,295,145 by 64,375, the quotient will be 97,788 solid feet, which is the contents of that volume of water which she must displace corresponding to her weight.

Displacement or Capacity.

The solid contents of a ship's bottom, were it any regular figure, might be easily calculated geometrically; but as its curves are so various, the following rule, by approximation, may be near enough for practice.

Take the half-breadths of every other frame, and double them, from 26 to O, in the half-breadth plan upon the upper water-line; then find the sum of these, together with half the foremost frame O, and aftermost frame 26. Now, the frames being equidistant, multiply that sum by 11 feet, the distance between every other frame, and the product is the area of the water-line contained between the frames 26 and O; then find the area of that part of the water-line afore O, and abaft 26, by taking the half-breadth of every timber, and proceed as before, and multiply by 2 feet 9 inches; find also the area of the stem, knee, and gripe, before the foremost-timber, also the area of the stern-post and rudder abaft the after-timber; then these areas being added to the first found, will be the area of the surface of the whole water-line. Note, the thickness of the bottom plank, as taken in that direction, must be added.

The areas of the other water-lines may be found in the same manner: then the sum of all these areas, except the uppermost and lowermost, of which only one-half of each must be taken, being multiplied by 3.6 feet, the distance between the water-lines (these lines in the sheer-plan being also equidistant from each other), and the product will be the solid content of the space contained between the lower and upper water-lines.

Add the area of the lower water-line to the area of the upper side of the keel; multiply half that sum by the distance between them, the product will be the solid content of that part between the lower water-line and upper edge of the keel.

The solid contents of the keel must be next found, by multiplying the area by its depth; then the sum of these solid contents will be the number of cubic feet contained in the immerfed part of the bottom, below the upper water-line.

The reason of the above rule will be obvious, by referring to the article STEREOMETRY; for there, to find the solid contents of any irregular body, the area of the surfaces must be taken by ordinates (and such are the joints of the frames of a ship), and those surfaces multiplied by the depth or depths (and such are the water-lines), which give the solid contents required.

The application of this rule, in finding the cubic feet contained in the bottom of the 74-gun ship, below the upper water-line in *Plate I.*

Area of the Upper Water-Line.

The breadth at						Ft.	In.
	frame 26	is	43 ft. 8 in.	the half of which is		21	10
	frame 22	-	-	-	-	45	11
	frame 18	-	-	-	-	47	7
	frame 14	-	-	-	-	48	4
	frame 10	-	-	-	-	48	8
	frame 6	-	-	-	-	48	8
	frame 2	-	-	-	-	48	8
	frame (1)	-	-	-	-	48	8
	frame B	-	-	-	-	48	8
	frame F	-	-	-	-	48	8
	frame K	-	-	-	-	48	0
	frame O	is	46 ft. 2 in.	the half of which is		23	1

× by the distance between the frames	-	-	526	9
			11	0

Area between 26 and O	-	-	5794	3
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The breadth at						Ft.	In.
	frame 26	is	43 ft. 8 in.	the half of which is		21	10
	timber 27	-	-	-	-	43	2
	frame 28	-	-	-	-	42	2
	timber 29	-	-	-	-	41	0
	frame 30	-	-	-	-	40	0
	timber 31	-	-	-	-	38	6
	frame 32	-	-	-	-	37	0
	timber 33	-	-	-	-	34	10
	frame 34	-	-	-	-	32	1
	timber 35	-	-	-	-	27	2
	frame 36	-	-	-	-	19	2
	timber 37	is	5 ft. 2 in.	the half of which is		2	7

× by the distance between the timbers	-	-	379	6
			2	9

Area of the post and rudder	-	-	1043	7 $\frac{1}{2}$
			10	1 $\frac{1}{2}$

Area abaft 26	-	-	1053	9
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The breadth at						Ft.	In.
	frame O	is	46 ft. 2 in.	the half of which is		23	1
	timber P	-	-	-	-	45	2
	frame Q	-	-	-	-	43	2
	timber R	-	-	-	-	41	8
	frame S	-	-	-	-	38	10
	timber T	-	-	-	-	36	0
	frame U	-	-	-	-	31	8
	timber W	-	-	-	-	26	3
	frame X	-	-	-	-	19	4
	timber Y	-	-	-	-	10	8
	half the stem	-	-	-	-	0	10

× by the distance between the timbers	-	-	316	8
			2	9

Area of the knee	-	-	870	10
			3	0

Area before O	-	-	873	10
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Area abaft 26	-	-	1053	9
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Area between 26 and O	-	-	5794	3
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Area of upper water-line	-	-	7721	10
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Area

SHIP-BUILDING.

Area of the Fourth Water-Line.

The breadth at			Ft.	In.
	frame 26	is 40 ft. 4 in. the half of which is	20	2
	frame 22	- - - - -	43	3
	frame 18	- - - - -	44	8 $\frac{1}{2}$
	frame 14	- - - - -	45	9 $\frac{1}{2}$
	frame 10	- - - - -	46	8
	frame 6	- - - - -	46	8
	frame 2	- - - - -	46	8
	frame (1)	- - - - -	46	8
	frame B	- - - - -	46	8
	frame F	- - - - -	46	8
	frame K	- - - - -	45	10
	frame O	is 43 ft. 0 in. the half of which is	21	6

× by the distance between the frames - $\frac{501}{11}$ 3 0

Area between 26 and O - $\frac{5513}{9}$

The breadth at			Ft.	In.
	frame 26	is 40 ft. 4 in. the half of which is	20	2
	timber 27	- - - - -	39	2
	frame 28	- - - - -	37	10
	timber 29	- - - - -	36	4
	frame 30	- - - - -	34	0
	timber 31	- - - - -	31	4
	frame 32	- - - - -	28	4
	timber 33	- - - - -	24	4
	frame 34	- - - - -	19	8
	timber 35	- - - - -	13	1
	frame 36	- - - - -	3	7
	timber 37	is 2 ft. 2 in. the half of which is	1	1

× by the distance between the timbers - $\frac{288}{2}$ 11 9

Area of the poft and rudder - $\frac{794}{10}$ 6 $\frac{1}{4}$ 1 $\frac{1}{2}$

Area abaft 26 - $\frac{804}{7\frac{3}{4}}$

The breadth at			Ft.	In.
	frame O	is 43 ft. 0 in. the half of which is	21	6
	timber P	- - - - -	41	8
	frame Q	- - - - -	39	10
	timber R	- - - - -	37	4
	frame S	- - - - -	34	4
	timber T	- - - - -	30	0
	frame U	- - - - -	25	10
	timber W	- - - - -	20	0
	frame X	- - - - -	12	8
	timber Y	is 4 ft. 6 in. the half of which is	2	3

× by the distance between the timbers - $\frac{265}{2}$ 5 9

Area of the stem and knee - $\frac{729}{4}$ 10 $\frac{3}{4}$ 0

Area before O - $\frac{733}{10\frac{3}{4}}$

Area abaft 26 - $\frac{804}{7\frac{3}{4}}$

Area between 26 and O - $\frac{5513}{9}$

Area of the fourth water-line - $\frac{7052}{3\frac{1}{2}}$

Area of the Third Water-Line.

The breadth at			Ft.	In.
	frame 26	is 34 ft. 0 in. the half of which is	17	0
	frame 22	- - - - -	39	1
	frame 18	- - - - -	41	0
	frame 14	- - - - -	42	5
	frame 10	- - - - -	43	2
	frame 6	- - - - -	43	8
	frame 2	- - - - -	43	8
	frame (1)	- - - - -	43	8
	frame B	- - - - -	43	8
	frame F	- - - - -	43	6
	frame K	- - - - -	41	8
	frame O	is 37 ft. 4 in. the half of which is	18	8

× by the distance between the frames - $\frac{461}{11}$ 2 0

Area between 26 and O - $\frac{5072}{10}$

The breadth at			Ft.	In.
	frame 26	is 34 ft. 0 in. the half of which is	17	0
	timber 27	- - - - -	32	0
	frame 28	- - - - -	30	1
	timber 29	- - - - -	27	7
	frame 30	- - - - -	24	6
	timber 31	- - - - -	21	3
	frame 32	- - - - -	17	4
	timber 33	- - - - -	12	5
	frame 34	- - - - -	9	1
	timber 35	- - - - -	6	0
	frame 36	- - - - -	3	6
	timber 37	is 1 ft. 6 in. the half of which is	0	9

× by the distance between the timbers - $\frac{201}{2}$ 6 9

Area abaft 26 - $\frac{554}{10}$ 1 $\frac{1}{2}$ 1 $\frac{1}{2}$

Area of the poft and rudder - $\frac{564}{3}$

The breadth at			Ft.	In.
	frame O	is 37 ft. 4 in. the half of which is	18	8
	timber P	- - - - -	35	2
	frame Q	- - - - -	32	10
	timber R	- - - - -	29	6
	frame S	- - - - -	26	6
	timber T	- - - - -	22	0
	frame U	- - - - -	17	8
	timber W	- - - - -	12	0
	frame X	- - - - -	3	0
	timber Y	is 1 ft. 10 in. the half of which is	0	11

× by the distance between the timbers - $\frac{198}{2}$ 9 9

Area of the stem and knee - $\frac{545}{1}$ 2 $\frac{1}{4}$ 2 $\frac{1}{4}$

Area before O - $\frac{546}{4\frac{1}{2}}$

Area abaft 26 - $\frac{564}{3}$

Area between 26 and O - $\frac{5072}{10}$

Area of the third water-line - $\frac{6183}{5\frac{1}{2}}$

SHIP-BUILDING.

Area of the Second Water-Line.

The breadth at		Ft.	In.
	frame 26 is 24 ft. 10 in. the half of which is	12	5
	frame 22 - - - - -	32	2
	frame 18 - - - - -	36	0
	frame 14 - - - - -	37	10
	frame 10 - - - - -	39	2
	frame 6 - - - - -	39	6
	frame 2 - - - - -	39	6
	frame (1) - - - - -	39	6
	frame B - - - - -	39	4
	frame F - - - - -	38	10
	frame K - - - - -	36	0
	frame O is 28 ft. 8 in. the half of which is	14	4

× by the distance between the frames - $\frac{404}{11}$ 7 0

Area between 26 and O - $\frac{4450}{5}$

The breadth at		Ft.	In.
	frame 26 is 24 ft. 10 in. the half of which is	12	5
	timber 27 - - - - -	22	0
	frame 28 - - - - -	19	0
	timber 29 - - - - -	15	10
	frame 30 - - - - -	13	4
	timber 31 - - - - -	10	3
	frame 32 - - - - -	8	1
	timber 33 - - - - -	6	1
	frame 34 - - - - -	4	3
	timber 35 - - - - -	3	0
	frame 36 - - - - -	2	2
	timber 37 is 1 ft. 6 in. the half of which is	0	9

× by the distance between the timbers - $\frac{117}{2}$ 2 9

Area of the rudder and post - $\frac{322}{9}$ $2\frac{1}{2}$ 6

Area abaft 26 - $\frac{331}{8\frac{1}{2}}$

The breadth at		Ft.	In.
	frame O is 28 ft. 8 in. the half of which is	14	4
	timber P - - - - -	25	6
	frame Q - - - - -	23	0
	timber R - - - - -	19	0
	frame S - - - - -	16	2
	timber T - - - - -	12	0
	frame U - - - - -	8	8
	timber W is 4 ft. 0 in. the half of which is	2	0

× by the distance between the timbers - $\frac{120}{2}$ 8 9

Area of the stem and knee - $\frac{331}{5}$ 10 10

Area before O - $\frac{337}{8}$

Area abaft 26 - $\frac{331}{8\frac{1}{2}}$

Area between 26 and O - $\frac{4450}{5}$

Area of the second water-line - $\frac{5119}{9\frac{1}{2}}$

Area of the First or Lower Water-Line.

The breadth at		Ft.	In.
	frame 26 is 10 ft. 0 in. the half of which is	5	0
	frame 22 - - - - -	20	2
	frame 18 - - - - -	26	8
	frame 14 - - - - -	30	4
	frame 10 - - - - -	32	0
	frame 6 - - - - -	33	4
	frame 2 - - - - -	33	8
	frame (1) - - - - -	33	8
	frame B - - - - -	32	10
	frame F - - - - -	32	0
	frame K - - - - -	26	6
	frame O is 17 ft. 0 in. the half of which is	8	6

× by the distance between the frames - $\frac{314}{11}$ 8 0

Area between 26 and O - $\frac{3461}{4}$

The breadth of		Ft.	In.
	frame 26 is 10 ft. 0 in. the half of which is	5	0
	timber 27 - - - - -	8	2
	frame 28 - - - - -	7	0
	timber 29 - - - - -	5	11
	frame 30 - - - - -	4	10
	timber 31 - - - - -	4	1
	frame 32 - - - - -	3	5
	timber 33 - - - - -	2	8
	frame 34 - - - - -	2	$2\frac{1}{2}$
	timber 35 - - - - -	1	10
	frame 36 - - - - -	1	7
	timber 37 is 1 ft. 4 in. the half of which is	0	8

× by the distance between the timbers - $\frac{47}{2}$ $4\frac{1}{2}$ 9

Area of the rudder and post - $\frac{130}{9}$ $3\frac{1}{8}$ 0

Area abaft 26 - $\frac{139}{3\frac{3}{8}}$

The breadth at		Ft.	In.
	frame O is 17 ft. 0 in. the half of which is	8	6
	timber P - - - - -	14	8
	frame Q - - - - -	12	3
	timber R - - - - -	9	8
	frame S - - - - -	7	0
	timber T - - - - -	4	4
	frame U is 1 ft. 10 in. the half of which is	0	11

× by the distance between the timbers - $\frac{57}{2}$ 4 9

Area of stem and knee - $\frac{157}{6}$ 8 $5\frac{1}{2}$

Area before O - $\frac{164}{1\frac{1}{2}}$

Area abaft 26 - $\frac{139}{3\frac{3}{8}}$

Area between 26 and O - $\frac{3461}{4}$

Area of the lower water-line - $\frac{3764}{8\frac{3}{8}}$

Area

SHIP-BUILDING.

Area of the Upper Side of the Keel.

	Ft.	In.
Length on the upper side or plane of the keel from the aft-side of the rudder - - - - -	177	2
Multiplied by its thickness - - - - -	1	6
Area of the upper side of the keel - - - - -	265	9

Displacement of the Bottom.

	Ft.	In.
Half the area of the upper water-line	3860	11
Whole area of the fourth water-line -	7052	3 $\frac{1}{2}$
Whole area of the third water-line -	6183	5 $\frac{1}{2}$
Whole area of the second water-line -	5119	9 $\frac{1}{2}$
Whole area of the lower water-line -	3764	8 $\frac{3}{4}$
Half the area of the upper side of keel	132	10 $\frac{1}{2}$
	26114.0729	
× by distance between the water-lines	3.6	
	94010.6624	
Area of the keel 265 ft. 9 in. × by } the depth, false keel included - }	531.5	
Cubic feet displaced - - - - -	94542.162	
× by pounds in a cubic foot of salt-water	64.375	
	6086151 lbs.	

As the estimated weight of the ship, with every thing on board, was 6,295,145 lbs. we find, by the above calculation, the upper water-line, as parallel with the keel, is placed too low, as the displacement is only equal to 6,086,151 lbs. Therefore proceed to find if the body of the ship is constructed to sail on an even keel, that is, whether the ship will be in her natural position when brought down to that line. For this purpose, let the centre of cavity, or centre of support, be next found, as then we may discern what proportion the displacement of the fore-part of the ship bears to the aft-part; for, should they not prove equal, the ship cannot be constructed to sail on an even keel.

Method of finding the Centre of Displacement or Support.

The centre of gravity of a ship, supposed homogeneous, and in a state of equilibrium, is in a perpendicular section, passing through the keel, and dividing the ship into two equal and similar parts, at a certain distance from the stern and altitude above the keel.

To ascertain the centre of displacement, or centre of gravity, of the immersed part of a ship's bottom, in a state of equilibrium, begin by determining the centre of gravity of the upper horizontal section, or water-line; and as the two sides are equal and similar, the middle line may be considered as the axis of the equilibrium, in which the centre of gravity of that surface is to be found; and as the surface of the upper water-line, and so of the others, has been already divided into equal parts, and the breadths taken at the several timbers or ordinates to find the displacement, we have only to observe that the spaces between those timbers are here considered as so many parallelograms, the centres of gravity of which parallelograms will form a system distributed on the middle line.

Then to find the centre of gravity of the system, in respect to the aft-side of the rudder, which is assumed for the first term of the momenta, we need not find the centre of gravity of each parallelogram, but divide the whole surface into three sections, and multiply their sums, as before, by the distance between the ordinates, and the product will be the area of each section.

Then to obtain the sum of the momenta of all the elementary parts of the surface, multiply the breadth of each ordinate into its distance from the axis of the momenta, or first ordinate; then take the sum of all these products, and, by multiplying this sum by the distance between the ordinates, we shall have the sum of all the momenta of the elementary parts of the surface; which, divided by the sum of the ordinates, will quote the distance of the centre of gravity of the whole surface from the axis of the momenta.

Lastly, the areas of the several planes or surfaces, and their momenta, being found, divide one by the other, and the quotient will be the distance of the centre of gravity of the whole section from the aft-side of the rudder.

SHIP-BUILDING.

Operation for the Plane of the Upper Horizontal Water-Line.

To find the centre of gravity of the plane abaft 26, from 37, its first ordinate.

		Ft. In.	Distant from 37.	Products. Ft. In.
Half of	37 ordinate is	2 7		
Whole of	36 - - -	19 2	Mult. by 1 =	19 2
	35 - - -	27 2	2 =	54 4
	34 - - -	32 1	3 =	96 3
	33 - - -	34 10	4 =	139 4
	32 - - -	37 0	5 =	185 0
	31 - - -	38 6	6 =	231 0
	30 - - -	40 0	7 =	280 0
	29 - - -	41 0	8 =	328 0
	28 - - -	42 2	9 =	379 6
	27 - - -	43 2	10 =	431 8
Half of	26 - - -	21 10	11 =	240 2
Sum	-	379 6	Sum	2384 5
Multiply by	-	2 9	diff. between ord.	2 9
Area	-	1043 7 $\frac{1}{2}$		

Divide by the sum of the ordinates	-	379 6	)	6557	1 $\frac{3}{4}$
Centre of gravity	-	-	-	17	3 $\frac{1}{4}$
Distance of the ordinate 37 from the aft-side of the rudder	-	-	-	6	9
Centre of gravity from aft-side of the rudder	-	-	-	24	0 $\frac{1}{4}$
Distance of the centre of gravity of the section of the rudder and stern-post from the aft-side of the rudder is	-	-	-	3	5

To find the centre of gravity of the plane between 26 and O, from 26, its first ordinate.

		Ft. In.	Distant from 26.	Products. Ft. In.
Half of	26 ordinate is	21 10		
Whole of	22 - - -	45 11	Mult. by 1 =	45 11
	18 - - -	47 7	2 =	95 2
	14 - - -	48 4	3 =	145 0
	10 - - -	48 8	4 =	196 8
	6 - - -	48 8	5 =	243 4
	2 - - -	48 8	6 =	292 0
	(1) - - -	48 8	7 =	340 8
	B - - -	48 8	8 =	389 4
	F - - -	48 8	9 =	438 0
	K - - -	48 0	10 =	480 0
Half of	O - - -	23 1	11 =	253 11
Sum	-	526 9	Sum	2920 0
Multiply by	-	11 0	diff. between ord.	11 0
Area	-	5794 3		

Divide by the sum of the ordinates	-	526 9	)	32120	0
Centre of gravity	-	-	-	61	5 $\frac{3}{4}$
Distance of the ordinate 26 from the aft-side of the rudder	-	-	-	37	0
Centre of gravity from aft-side of the rudder	-	-	-	98	5 $\frac{3}{4}$

To find the centre of gravity of the plane before O, from O, its first ordinate.

		Ft. In.	Distant from O.	Products. Ft. In.
Half of	O ordinate is	23 1		
Whole of	P - - -	45 2	Mult. by 1 =	45 2
	Q - - -	43 2	2 =	86 4
	R - - -	41 8	3 =	125 0
	S - - -	38 10	4 =	155 4
	T - - -	36 0	5 =	180 0
	U - - -	31 8	6 =	190 0
	W - - -	26 3	7 =	183 9
	X - - -	19 4	8 =	154 8
	Y - - -	10 8	9 =	96 0
Half of	Stem - - -	0 10	10 =	8 4
Sum	-	316 8	Sum	1224 7
Multiply by	-	2 9	diff. between ord.	2 9
Area	-	870 10		

Divide by the sum of the ordinates	-	316 8	)	3367	7 $\frac{1}{4}$
Centre of gravity	-	-	-	10	7 $\frac{1}{2}$
Distance of the ordinate O from the aft-side of the rudder	-	-	-	158	0
Centre of gravity from aft-side of the rudder	-	-	-	168	7 $\frac{1}{2}$
Centre of gravity of knee before the stem is	-	-	-	1	0
Distance of the centre of gravity of the section of the knee, before the aft-side of the rudder, is	-	-	-	186	6

Areas of the several planes, and their momenta.

Ft.	In.		Ft.	In.
		Area of the after-plane 1043 7½		
1043	7½	Mult. by 24 0¼ its momentum =	25067	9
		Area of the midship-plane 5794 3		
5794	3	Mult. by 98 5¾ its momentum =	570612	6½
		Area of the fore-plane 870 10		
870	10	Mult. by 168 7½ its momentum =	146844	3½
		Area of rudder and post 10 1½		
10	1½	Mult. by 3 5 its momentum =	34	7½
		Area of the knee 3 0		
3	0	Mult. by 186 6 its momentum =	559	6
7721	10	Whole areas. Sum of momenta	743118	7¾

Now 743118 ft. 7 $\frac{3}{4}$ in. divided by 7721 ft. 10 in. gives 96 ft. 2 $\frac{3}{4}$ in., the distance of the centre of gravity of the whole section of the upper horizontal water-line from the aft-side of the rudder.

SHIP-BUILDING.

Operation for the Plane of the Fourth Horizontal Water-Line.

To find the centre of gravity of the plane abaft 26, from 37, its first ordinate.

		Ft. In.	Distant from 37.	Products. Ft. In.
Half of 37 ordinate is		1 1		
Whole of 36	- -	3 7	Mult. by 1 =	3 7
35	- -	13 1	2 =	26 2
34	- -	19 8	3 =	39 0
33	- -	24 4	4 =	97 4
32	- -	28 4	5 =	141 8
31	- -	31 4	6 =	188 0
30	- -	34 0	7 =	238 0
29	- -	36 4	8 =	290 8
28	- -	37 10	9 =	340 6
27	- -	39 2	10 =	391 8
Half of 26	- -	20 2	11 =	221 10
Sum	-	288 11	Sum	1998 5
Multiply by		2 9	dift. between ord.	2 9
Area	-	794 6 $\frac{1}{4}$		

Divide by the sum of the ordinates	- 288 11)	5495 7 $\frac{3}{4}$
Centre of gravity	- - - -	19 0 $\frac{1}{4}$
Distance of the ordinate 37 from the aft-side of the rudder	- - - -	6 9
Centre of gravity from aft-side of the rudder		25 9 $\frac{1}{4}$
Distance of the centre of gravity of the section of the rudder and item-post from the aft-side of the rudder is	- - -	3 5

To find the centre of gravity of the plane between 26 and O, from 26, its first ordinate.

		Ft. In.	Distant from 26.	Products. Ft. In.
Half of 26 ordinate is		20 2		
Whole of 22	- -	43 3	Mult. by 1 =	43 3
18	- -	44 8 $\frac{1}{2}$	2 =	89 5
14	- -	45 9 $\frac{1}{2}$	3 =	137 4 $\frac{1}{2}$
10	- -	46 8	4 =	186 8
6	- -	46 8	5 =	233 4
2	- -	46 8	6 =	280 0
(1)	- -	46 8	7 =	326 8
B	- -	46 8	8 =	373 4
F	- -	46 8	9 =	420 0
K	- -	45 10	10 =	458 4
Half of O	- -	21 6	11 =	236 6
Sum	-	501 3	Sum	2784 10 $\frac{1}{2}$
Multiply by		11 0	dift. between ord.	11 0
Area	-	5513 9		

Divide by the sum of the ordinates	- 501 3)	30633 7 $\frac{1}{2}$
Centre of gravity	- - - -	61 1 $\frac{3}{8}$
Distance of the ordinate 26 from the aft-side of the rudder	- - - -	37 0
Centre of gravity from aft-side of the rudder		98 1 $\frac{3}{8}$

To find the centre of gravity of the plane before O, from O, its first ordinate.

		Ft. In.	Distant from O.	Products. Ft. In.
Half of O ordinate is		21 6		
Whole of P	- -	41 8	Mult. by 1 =	41 8
Q	- -	39 10	2 =	79 8
R	- -	37 4	3 =	112 0
S	- -	34 4	4 =	137 4
T	- -	30 0	5 =	150 0
U	- -	25 10	6 =	155 0
W	- -	20 0	7 =	140 0
X	- -	12 8	8 =	101 4
Half of Y	- -	2 3	9 =	20 3
Sum	-	265 5	Sum	937 3
Multiply by		2 9	dift. between ord.	2 9
Area	-	729 10 $\frac{3}{4}$		

Divide by the sum of the ordinates	- 265 5)	2577 4 $\frac{3}{4}$
Centre of gravity	- - - -	9 8 $\frac{1}{2}$
Distance of the ordinate O from the aft-side of the rudder	- - - -	158 0
Centre of gravity from aft-side of the rudder		167 8 $\frac{1}{2}$
Centre of gravity of the section of the item and knee before Y is	- - - -	1 4
Distance of the centre of gravity of the section of the knee, before the aft-side of the rudder, is	- - - -	184 1

Areas of the several planes, and their momenta.

Ft. In.		Ft. In.
5513 9	Area of the midship-plane	5513 9
	Mult. by 98 1 $\frac{3}{8}$ its momentum =	541003 7 $\frac{1}{2}$
794 6 $\frac{1}{4}$	Area of the after-plane	794 6 $\frac{1}{4}$
	Mult. by 25 9 $\frac{1}{4}$ its momentum =	20475 5 $\frac{1}{4}$
729 10 $\frac{3}{4}$	Area of the fore-plane	729 10 $\frac{3}{4}$
	Mult. by 167 8 $\frac{1}{2}$ its momentum =	122409 10
10 1 $\frac{1}{2}$	Area of rudder and post	10 1 $\frac{1}{2}$
	Mult. by 3 5 its momentum =	34 7 $\frac{1}{8}$
4 0	Area of the item and knee	4 0
	Mult. by 184 1 its momentum =	736 4
7052 3 $\frac{1}{2}$	Whole areas.	Sum of momenta 684659 9 $\frac{7}{8}$

Now 684659 ft. 9 $\frac{7}{8}$ in. divided by 7052 ft. 3 $\frac{1}{2}$ in. gives 97 ft. 1 in., the distance of the centre of gravity of the whole section of the fourth horizontal water-line from the aft-side of the rudder.

SHIP-BUILDING.

Operation for the Plane of the Third Horizontal Water-Line.

To find the centre of gravity of the plane abaft 26, from 37, its first ordinate.

		Ft. In.	Distant from 37.	Products. Ft. In.
Half of	37 ordinate is	0 9		
Whole of	36 - -	3 6	Mult. by 1 =	3 6
	35 - -	6 0	2 =	12 0
	34 - -	9 1	3 =	27 3
	33 - -	12 5	4 =	49 8
	32 - -	17 4	5 =	86 8
	31 - -	21 3	6 =	127 6
	30 - -	24 6	7 =	171 6
	29 - -	27 7	8 =	220 8
	28 - -	30 1	9 =	270 9
	27 - -	32 0	10 =	320 0
Half of	26 - -	17 0	11 =	187 0
Sum	-	201 6	Sum	1476 6
Multiply by	-	2 9	dift. between ord.	2 9
Area	-	554 1½		

Divide by the sum of the ordinates	-	201 6	)	4060	4½
Centre of gravity	-	-	-	20	1¾
Distance of the ordinate 37 from the aft-side of the rudder	-	-	-	6	9
Centre of gravity from aft-side of the rudder	-	-	-	26	10¾
Distance of the centre of gravity of the section of the rudder and stern-post from the aft-side of the rudder is	-	-	-	3	5

To find the centre of gravity of the plane between 26 and O, from 26, its first ordinate.

		Ft. In.	Distant from 26.	Products. Ft. In.
Half of	26 ordinate is	17 0		
Whole of	22 - -	39 1	Mult. by 1 =	39 1
	18 - -	41 0	2 =	82 0
	14 - -	42 5	3 =	127 3
	10 - -	43 2	4 =	172 8
	6 - -	43 8	5 =	218 4
	2 - -	43 8	6 =	262 0
	(1) - -	43 8	7 =	305 8
	B - -	43 8	8 =	349 4
	F - -	43 6	9 =	391 6
	K - -	41 8	10 =	416 8
Half of	O - -	18 8	11 =	205 4
Sum	-	461 2	Sum	2569 10
Multiply by	-	11 0	dift. between ord.	11 0
Area	-	5072 10		

Divide by the sum of the ordinates	-	461 2	)	28268	2
Centre of gravity	-	-	-	61	3½
Distance of the ordinate 26 from the aft-side of the rudder	-	-	-	37	0
Centre of gravity from aft-side of the rudder	-	-	-	98	3½

To find the centre of gravity of the plane before O, from O, its first ordinate.

		Ft. In.	Distant from O.	Products. Ft. In.
Half of	O ordinate is	18 8		
Whole of	P - -	35 2	Mult. by 1 =	35 2
	Q - -	32 10	2 =	65 8
	R - -	29 6	3 =	88 6
	S - -	26 6	4 =	106 0
	T - -	22 0	5 =	110 0
	U - -	17 8	6 =	106 0
	W - -	12 0	7 =	84 0
	X - -	3 0	8 =	24 0
Half of	Y - -	0 11	9 =	8 3
Sum	-	198 3	Sum	627 7
Multiply by	-	2 9	dift. between ord.	2 9
Area	-	545 2¼		

Divide by the sum of the ordinates	-	198 3	)	1725	10¾
Centre of gravity	-	-	-	8	8½
Distance of the ordinate O from the aft-side of the rudder	-	-	-	158	0
Centre of gravity from aft-side of the rudder	-	-	-	166	8½
Centre of gravity of stem and knee before Y is	-	-	-	0	6
Distance of the centre of gravity of the section of the knee, from the aft-side of the rudder	-	-	-	183	3

Areas of the several planes, and their momenta.

Ft.	In.		Ft.	In.
		Area of the after-plane	554 1½	
554	1½	Mult. by 26 10¾ its momentum =	14903	7½
		Area of midship-plane	5072 10	
5072	10	Mult. by 98 3½ its momentum =	498616	10¾
		Area of fore-plane	545 2¼	
545	2¼	Mult. by 166 8½ its momentum =	90881	7¾
		Area of rudder and post	10 1½	
10	1½	Mult. by 3 5 its momentum =	34	7½
		Area of stem and knee	1 2	
1	2	Mult. by 183 its momentum =	213	9½
6183	5½	Whole areas.	Sum of momenta	604650 6½

Now 604650 ft. 6½ in. divided by 6183 ft. 5½ in. gives 97 ft. 9½ in., the distance of the centre of gravity of the whole section of the third horizontal water-line from the aft-side of the rudder.

SHIP-BUILDING.

Operation for the Plane of the Second Horizontal Water-Line.

To find the centre of gravity of the plane abaft 26, from 37, its first ordinate.

		Ft. In.	Distant from 37.	Products. Ft. In.
Half of 37 ordinate is	0	9		
Whole of 36	-	2 2	Mult. by 1 =	2 2
35	-	3 0	2 =	6 0
34	-	4 3	3 =	12 9
33	-	6 1	4 =	24 4
32	-	8 1	5 =	40 5
31	-	10 3	6 =	61 6
30	-	13 4	7 =	93 4
29	-	15 10	8 =	126 8
28	-	19 0	9 =	171 0
27	-	22 0	10 =	220 0
Half of 26	-	12 5	11 =	136 7
Sum	-	117 2	Sum	894 9
Multiply by	-	2 9	dist. between ord.	2 9
Area	-	322 2½		

Divide by the sum of the ordinates	-	117 2	)	2460	6¾
Centre of gravity	-	-	-	-	21 0
Distance of the ordinate 37 from the aft-side of the rudder	-	-	-	-	6 9
Centre of gravity from aft-side of the rudder	-	-	-	-	27 9
Distance of the centre of gravity of the section of the rudder and stem-post from the aft-side of the rudder is	-	-	-	-	3 5

To find the centre of gravity of the plane between 26 and O, from 26, its first ordinate.

		Ft. In.	Distant from 26.	Products. Ft. In.
Half of 26 ordinate is	12	5		
Whole of 22	-	32 2	Mult. by 1 =	32 2
18	-	36 0	2 =	72 0
14	-	37 10	3 =	113 6
10	-	39 2	4 =	156 8
6	-	39 6	5 =	197 6
2	-	39 6	6 =	237 0
(1)	-	39 6	7 =	276 6
B	-	39 4	8 =	314 8
F	-	38 10	9 =	349 6
K	-	36 0	10 =	360 0
Half of O	-	14 4	11 =	157 8
Sum	-	404 7	Sum	2267 2
Multiply by	-	11 0	dist. between ord.	11 0
Area	-	4450 5		

Divide by the sum of the ordinates	-	404 7	)	24938	10
Centre of gravity	-	-	-	-	61 7½
Distance of the ordinate 26 from the aft-side of the rudder	-	-	-	-	37 0
Centre of gravity from aft-side of the rudder	-	-	-	-	98 7½

To find the centre of gravity of the plane before O, from O, its first ordinate.

		Ft. In.	Distant from O.	Products. Ft. In.
Half of O ordinate is	14	4		
Whole of P	-	25 6	Mult. by 1 =	25 6
Q	-	23 0	2 =	46 0
R	-	19 0	3 =	57 0
S	-	16 2	4 =	64 8
T	-	12 0	5 =	60 0
U	-	8 8	6 =	52 0
Half of W	-	2 0	7 =	14 0
Sum	-	120 8	Sum	319 2
Multiply by	-	2 9	dist. between ord.	2 9
Area	-	331 10		

Divide by the sum of the ordinates	-	120 8	)	877	8½
Centre of gravity	-	-	-	-	7 3¼
Distance of the ordinate O from the aft-side of the rudder	-	-	-	-	158 0
Centre of gravity from aft-side of the rudder	-	-	-	-	165 3¼
Centre of gravity of the stem and knee before W	-	-	-	-	2 3
Distance of the centre of gravity of the section of the stem and knee from the aft-side of the rudder is	-	-	-	-	179 6

Areas of the several planes, and their momenta.

Ft. In.		Ft. In.
322 2½	Area of the after-plane	322 2½
	Mult. by 27 9 its momentum	= 8941 3¼
4450 5	Area of the midship-plane	4450 5
	Mult. by 98 7½ its momentum	= 438968 7½
331 10	Area of fore-plane	331 10
	Mult. by 165 3¼ its momentum	= 54842 4¼
9 6	Area of rudder and post	9 6
	Mult. by 3 5 its momentum	= 32 5½
5 10	Area of the stem and knee	5 10
	Mult. by 179 6 its momentum	= 1047 1
5119 9½	Whole areas.	Sum of momenta
		503831 9½

Now 503831 ft. 9½ in. divided by 5119 ft. 9½ in. gives 98 ft. 4⅞ in., the distance of the centre of gravity of the whole section of the second horizontal water-line from the aft-side of the rudder.

SHIP-BUILDING.

Operation for the Plane of the First or Lower Horizontal Water-Line.

To find the centre of gravity of the plane abaft 26, from 37, its first ordinate.

		Ft. In.	Distant from 37.	Products. Ft. In.
Half of 37 ordinate is	-	0 8		
Whole of 36	-	1 7	Mult. by 1 =	1 7
35	-	1 10	2 =	3 8
34	-	2 2 $\frac{1}{2}$	3 =	6 7 $\frac{1}{2}$
33	-	2 8	4 =	10 8
32	-	3 5	5 =	17 1
31	-	4 1	6 =	24 6
30	-	4 10	7 =	33 10
29	-	5 11	8 =	47 4
28	-	7 0	9 =	63 0
27	-	8 2	10 =	81 8
Half of 26	-	5 0	11 =	55 0
Sum	-	47 4 $\frac{1}{2}$	Sum	344 11 $\frac{1}{2}$
Multiply by	-	2 9	dist. between ord.	2 9
Area	-	130 3 $\frac{1}{8}$		

Divide by the sum of the ordinates - 47 4 $\frac{1}{2}$) 948 7 $\frac{5}{8}$

Centre of gravity - - - - - 20 0 $\frac{1}{4}$

Distance of the ordinate 37 from the aft-side of the rudder - - - - - 6 9

Centre of gravity from aft-side of the rudder - - - - - 26 9 $\frac{1}{4}$

Distance of the centre of gravity of the section of the rudder and stern-post from the aft-side of the rudder is - - - - - 3 5

To find the centre of gravity of the plane between 26 and O, from 26, its first ordinate.

		Ft. In.	Distant from 26.	Products. Ft. In.
Half of 26 ordinate is	-	5 0		
Whole of 22	-	20 2	Mult. by 1 =	20 2
18	-	26 8	2 =	53 4
14	-	30 4	3 =	91 0
10	-	32 0	4 =	128 0
6	-	33 4	5 =	166 8
2	-	33 8	6 =	202 0
(1)	-	33 8	7 =	235 8
B	-	32 10	8 =	262 8
F	-	32 0	9 =	288 0
K	-	26 6	10 =	265 0
Half of O	-	8 6	11 =	93 6
Sum	-	314 8	Sum	1806 0
Multiply by	-	11 0	dist. between ord.	11 0
Area	-	3461 4		

Divide by the sum of the ordinates - 314 8) 19866 0

Centre of gravity - - - - - 63 1 $\frac{1}{2}$

Distance of the ordinate 26 from the aft-side of the rudder - - - - - 37 0

Centre of gravity from aft-side of the rudder - - - - - 100 1 $\frac{1}{2}$

To find the centre of gravity of the plane before O, from O, its first ordinate.

		Ft. In.	Distant from O.	Products. Ft. In.
Half of O ordinate is	-	8 6		
Whole of P	-	14 8	Mult. by 1 =	14 8
Q	-	12 3	2 =	24 6
R	-	9 8	3 =	29 0
S	-	7 0	4 =	28 0
T	-	4 4	5 =	21 8
Half of U	-	0 11	6 =	5 6
Sum	-	57 4	Sum	123 4
Multiply by	-	2 9	dist. between ord.	2 9
Area	-	157 8		

Divide by the sum of the ordinates - 57 4) 339 2

Centre of gravity - - - - - 5 11

Distance of the ordinate O from the aft-side of the rudder - - - - - 158 0

Centre of gravity from aft-side of the rudder - - - - - 163 11

Centre of gravity of the stem and knee before U - - - - - 2 7

Distance of the centre of gravity of the section of the stem and knee from the aft-side of the rudder - - - - - 176 1

Areas of the several planes, and their momenta.

	Ft. In.		Ft. In.
Area of the after-plane	130 3 $\frac{1}{8}$	Mult. by 26 9 $\frac{1}{4}$ its momentum =	3487 8 $\frac{7}{8}$
Area of midship-plane	3461 4	Mult. by 100 1 $\frac{1}{2}$ its momentum =	346566 0
Area of the fore-plane	157 8	Mult. by 163 11 its momentum =	25844 2 $\frac{1}{8}$
Area of rudder and post	9 0	Mult. by 3 5 its momentum =	30 9
Area of stem and knee	6 5 $\frac{1}{2}$	Mult. by 176 1 its momentum =	1137 2 $\frac{1}{8}$
Whole areas.	3764 8 $\frac{7}{8}$	Sum of momenta	377065 10 $\frac{3}{8}$

Now 377065 ft. 10 $\frac{3}{8}$ in. divided by 3764 ft. 8 $\frac{7}{8}$ in. gives 100 ft. 1 $\frac{1}{2}$ in., the distance of the centre of gravity of the whole section of the first or lower horizontal water-line from the aft-side of the rudder.

SHIP-BUILDING.

Operation for the Plane of the Keel, &c.

To find the centre of gravity for the plane of the keel, &c.

The length on the upper side or plane of the keel, from the aft-side of the rudder, is	Ft.	In.
-	177	2
Multiplied by its thickness	1	6

Area of the plane	265	9
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Distance of its centre of gravity from the aft-side of the rudder, being equal to half its length	88	7
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Now 265 feet 9 inches, multiplied by 88 feet 7 inches, is equal to the momentum 23540 feet $1\frac{5}{8}$ inch.

The centres of gravity of the six planes having been found, the distance of the centre of gravity of the whole bottom of the ship, from the aft-side of the rudder, is obtained as follows:

From the principles already explained, the distance of the centre of gravity of the bottom, from the aft-side of the rudder, is equal to the sum of the momenta of an infinite number of horizontal planes, divided by the sum of these planes; or, which is the same, by the solidity of the bottom. As, however, we have no more than six planes, we must conceive their momenta as the ordinates of a curve, whose distances may be the same as that of the horizontal planes.

Now the sum of these ordinates, or planes, except the first and last, of which take but half, being multiplied by their distance, gives the surface of the curve; of which any ordinate whatever represents the momentum of the horizontal plane at the same height as these ordinates; and the whole surface will represent the sum of the momenta of all the horizontal planes.

	Area of the Planes.		Momenta.	
	Ft.	In.	Ft.	In.
Half of the upper	3860	11	371559	$3\frac{7}{8}$
All the fourth	7052	$3\frac{1}{2}$	684659	$9\frac{5}{8}$
third	6183	$5\frac{1}{2}$	604650	$6\frac{1}{2}$
second	5119	$9\frac{1}{2}$	503831	$9\frac{1}{2}$
first	3764	$8\frac{7}{8}$	377065	$10\frac{3}{8}$
Half the keel	132	$10\frac{1}{2}$	11770	$0\frac{3}{4}$
Sum	26114	$0\frac{7}{8}$	2553537	$4\frac{7}{8}$

Now 2553537 feet $4\frac{7}{8}$ inches, divided by 26114 feet $\frac{7}{8}$ of an inch, gives 97 feet $9\frac{3}{8}$ inches, the distance of the centre of gravity of the bottom of the ship from the aft-side of the rudder.

The height of the centre of gravity of the bottom may be thus found.

To half of the plane of the keel and half of the upper horizontal plane, add all the intermediate planes, and multiply them progressively as before, taking the upper side of the keel for the axis of the momenta; then that sum being multiplied by the distance between the planes, and divided by the sum of the planes, taking half of the first and last, gives the height of the centre of gravity of the bottom above the keel.

	Area of the Planes.		Distance from Keel.	Products.	
	Ft.	In.		Ft.	In.
Half of the keel	132	$10\frac{1}{2}$	\times by 1 =	3764	$8\frac{7}{8}$
All the lower	3764	$8\frac{7}{8}$		2	10239
second	5119	$9\frac{1}{2}$		3	18550
third	6183	$5\frac{1}{2}$		4	28209
fourth	7052	$3\frac{1}{2}$		5	19304
Half the fifth	3860	11			7
Sum	26114	$0\frac{7}{8}$		80068	$5\frac{3}{8}$

Now 80068 feet $5\frac{3}{8}$ inches, divided by 26114 feet $\frac{7}{8}$ of an inch, gives 3 feet $\frac{3}{4}$ of an inch; which, multiplied by 3.6 feet, the distance between the horizontal sections, gives 11 feet $\frac{1}{4}$ of an inch, the height of the centre of gravity of the bottom of the ship above the under side of the keel.

The height of the centre of gravity of the bottom of the ship, and its distance from the aft-side of the rudder, being found, the ship being supposed in an upright position, the centre of gravity will necessarily be in the perpendicular longitudinal section, supposed to divide the ship in two equal and similar parts at 97 feet $9\frac{3}{8}$ inches, the distance of the centre of gravity of the bottom of the ship before the aft-side of the rudder, which comes between the frame 6 and 2 in the after-body. It may now be ascertained whether the ship will be in her natural position when floating at the upper horizontal line, or constructed to sail on an even keel. Thus, separate the displacement of that part of the bottom before the centre of gravity or support, and see how it agrees with that part of the bottom abaft it, as we may then examine the difference, if any, as in the following examples.

SHIP-BUILDING.

Find the Displacement or Solidity of the Bottom before the Centre of Gravity or Support, which is 5 ft. $3\frac{5}{8}$ in. abaft Frame 2.

Water-lines.										Water-lines and Keel.						
		Upper.		4th.		3d.		2d.		Lower.						
		Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.					
Half of	2 is	24	4	23	4	21	9	19	9	16	10	24	4	Upper water-line half the area	1764.7080	
Whole of	(1)	48	8	46	8	43	8	39	6	33	8	46	8	Fourth do. whole area	3271.2291	
	B	48	8	46	8	43	8	39	4	32	10	43	8	Third do. - -	2888.4374	
	F	48	8	46	8	43	6	38	10	32	0	39	6	Second do. - -	2402.9166	
	K	48	0	45	10	41	8	36	0	26	6	33	8	Lower do. - -	1817.7916	
Half of	O	23	1	21	6	18	8	14	4	8	6	0	9	Keel - half the area	56.	
		241	5	230	8	212	11	187	9	150	4	188	7	12200.0927		
		11	0	11	0	11	0	11	0	11	0	5	3 ⁵ / ₈	Area between 2 and the centre of gravity - } 999.474		
		2655	7	2537	4	2342	1	2065	3	1653	8	13200.5667				
		870	10	729	10 ³ / ₄	545	2 ¹ / ₄	331	10	157	8					
Areas before O		3	0	4	0	1	2	5	10	6	5 ¹ / ₂	× by distance between water- lines - - } .. 3.6				
Areas -		3529	5	3271	2 ³ / ₄	2888	5 ¹ / ₄	2402	11	1817	9 ¹ / ₂	999.474				
														47522.0401		
														Solidity of keel before centre		238.5
														Solid feet displaced before the centre of support		47760.5401
														Solid feet displaced abaft the centre of support		46777.2177
														The after part less than fore part		983.3224

Find also the Displacement or Solidity of the Bottom abaft the Centre of Gravity or Support, which is 5 ft. $8\frac{1}{8}$ in. afore Frame 6.

Water-lines.						Water-lines and Keel.		Feet.
Upper.	4th.	3d.	2d.	Lower.				
Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.			
Half of 6 is 24 4	23 4	21 10	19 9	16 8	24 4	Upper water-line half the area	1828.5416	
Whole of 10 48 8	46 8	43 2	39 2	32 0	46 8	Fourth do. whole area	3267.7291	
14 48 4	45 9½	42 5	37 10	30 4	43 8	Third do. - -	2813.75	
18 47 7	44 8½	41 0	36 0	26 8	39 6	Second do. - -	2282.375	
22 45 11	43 3	39 1	32 2	20 2	33 4	Lower do. - -	1578.427	
Half of 26 21 10	20 2	17 0	12 5	5 0	0 9	Keel - half the area	69.	
236 8	223 11	204 6	177 4	130 10	188 3	Area between 6 and the centre of gravity		11839.8227
11 0	11 0	11 0	11 0	11 0	5 8⅜			1072.460
2603 4	2463 1	2249 6	1950 8	1439 2		× by distance between water- lines		12912.2827
1043 7½	794 6¼	554 1½	322 2½	130 3⅛				3.6
Areas abaft 26 } 10 1½	10 1½	10 1½	9 6	9 0				
Areas 3657 1	3267 8¾	2813 9	2282 4½	1578 5⅛	1072.460	Solidity of keel abaft centre		46484.2177 293.
Solid feet displaced abaft the centre of support								46777.2177
Solid feet displaced before the centre of support								47760.5401
Solid feet displaced by the whole bottom								94537.7578

By

SHIP-BUILDING.

By the result of the above calculation it appears, that the after-part of the bottom has a minus of 983.3224 feet, its contents being 983.3224 less than the fore-part; and was the ship to be constructed to sail on an even keel, it would be necessary to fill the after-part half the difference, or 491.6612 feet, and reduce the fore-part until it had lost the same quantity; but to alter the after-part of the ship from its present construction, or to make it fuller, would retard her velocity, and prevent the water collapsing at the rudder; for the run of a ship should be neither too fine nor too full, but so constructed that the column of water should exactly meet upon the stern-post, then the rudder will have its full power. The quarter above the load-water-line should be very full, to support the ship when rising forward to a sea, and also to enable her to scud.

In regard to the failing trim of a vessel, it is the decided opinion of most scientific men, that ships or vessels of the larger classes should always be so constructed as to sail on, or nearly on an even keel, that is, so that the ship, when trimmed for failing, should have her keel parallel to the surface of the water; therefore, by as much as the effort of the wind on the sails and masts in forcing the ship through the water has a constant tendency to depress the bow, so much should the ship be trimmed by the stern, as that will be found most advantageous both to their failing and steering.

Many think it inconsistent to construct a ship to sail on an even keel, and yet to place the midship-bend or greatest breadth very forward. A ship so intended to sail, ought, as they conceive, when launched, to have an equal bearing fore and aft, in order that, before the ballast is stowed, she may be on an even keel; and they think that the ballast, if not placed equally fore and aft, must inevitably strain the sheer of the ship. Nevertheless, experience convinces us it is not materially detrimental; for many ships, when launched, will swim four feet by the stern, more or less, and yet when trimmed for failing, they are found to go faster on an even keel, and receive little or no damage if carefully stowed.

Some ships are too clean abaft, and require to sail by the stern; because they have no bearing for fifteen or twenty feet from aft, till the buttock is brought well into the water; and even then, for want of being fuller lower down, when the sea leaves the buttock, the over-hanging of the stern will strain the ship, and occasion her to tremble, till the next sea, with redoubled force, strike the buttock as the stern is falling, and so shake the ship; in which case it will be well, if some part of the masts be not carried away by the shock: however, this kind of motion must retard the velocity. This accident, though rare, is dangerous, and should be prevented in the construction of the ship.

With respect to ships that ought to fail some feet by the stern, on account of their insufficiency abaft, it is the opinion of many, that if a line were drawn to be well with the lower side of the keel, in the middle of the ship's length, and half the difference set up at the aft-part of the stern-post from the lower side of the keel, and that part of the keel and dead-wood were taken off, and placed under the fore-part of the keel, with the after-end that was before to be forward, so as to make the lower part of the keel straight, as before, the ship would then sail somewhat faster, and be the better: for when a ship is brought so much down by the stern, the keel, not being parallel to the surface of the water, (to which the ship generally sails parallel,) must occasion a pressure at the under side of the keel, equal to the weight of water displaced by the breadth of the keel, and to the angle which the keel makes with the surface of the water in its own length. This may shew why so many ships, differently constructed, are found to sail best on an even keel, although many of them were

designed by the constructor to sail by the stern. Finding the result rather in favour of an even keel, the 74, *Plate I.*, was so constructed, as most likely to answer every purpose. By that means the water-lines were drawn parallel to the keel, and were thereby more useful as well as more properly placed to form the body; for when the square timbers, and the water-lines, being square to the timber, properly agree with each other, and are fair curves, the ribband-lines, or any other section, will likewise be fair, or as fair as they should be, allowing the preference to the water-lines and square timbers.

When water-lines are not designed to be parallel to the keel, the draught is generally formed by ribband-lines, because the water-lines differing in height at every timber, require the square timbers to be formed before their height can be set off; and when the water-lines are run, if not approved of, much of the work must be done over again, the water-lines being more regarded than the ribband-lines; for many ships are constructed by ribband-lines only, which seem to produce fair curves, yet forward, and aft especially, they make a very unfair body, which is detrimental to velocity.

Small vessels, as cutters, &c. draw much more water aft than forward, and their bows are more full in proportion to the after-part; nor would it answer so well were their line of floatation nearly parallel with the keel, but spreading as it does aloft, especially towards their bow, the bow meets the fluid in a more slanting direction, and experiences far less resistance; and the depression of the stern, with the impulse of the aftermost sails, causes a proper counter-balance, and propels the vessel through the water with greater velocity than if otherwise constructed; for the after-part of those vessels is generally very clean or tapering, which necessarily contributes to make the vessel weatherly, and causes it, under judicious management, to turn as it were on a pivot.

A ship may be built to a precise draught of water, by which the construction will be founded upon true principles; but when a ship is not built to one precise draught more than another, it will be a very difficult, and one of the most complex questions in ship-building to determine this point. It may be imagined that no more is necessary than to make the ship swim in the water, so as to be capable of carrying the greatest sail; but when a ship is very deep in the water, it will greatly increase the resistance, and consequently retard her sailing; hence a long ship will draw less water than a short one, which is a good property, and the resistance at the stern being less, she will therefore sail faster. The resistance, however, must be calculated, not absolutely, but relatively, and in proportion to the sail she spreads.

In ships of war, the load-water-line must be governed by the height of the lower ports above the water in midships; and this we find in line-of-battle ships should invariably be from five to six feet, in frigates from six to seven feet, and in sloops, cutters, &c. from four to five feet.

Ships for commerce are generally constructed to carry a certain cargo, and their principal dimensions are determined according to the trade for which they are particularly designed; therefore the line of floatation, or load-water-line, is not confined in them so exactly to a certain height.

Ships of the line, from long practice, have been found to sail best when inclined one foot, or rather more, by the stern. Thus, the 74-gun ship in *Plate I.* load-water-line, when fitted for sea, was 20 feet forward and 21 feet abaft; therefore it only remains to be ascertained, whether the whole displacement of the bottom under the load-water-line agrees with the estimated weight of the ship, &c. when fit for sea, by multiplying the mean area of the load and upper horizontal water-lines by six inches, the mean depth, and adding it to the displacement already found: as in the following operation.

Area

SHIP-BUILDING.

Area of the Load-Water-Line.

	Ft.	In.		Ft.	In.		Ft.	In.
Half the stem	is	0 10	Half of ordinate	O	is 23 3	Half of ordinate	26	is 22 1
	Y	10 8		K	48 3		27	43 3
	X	19 6		F	49 2		28	42 6
	W	26 6		B	49 4		29	41 10
	U	32 0 $\frac{1}{2}$		(1)	49 4		30	40 5
Whole of ordinate	T	36 4 $\frac{1}{2}$	Whole of ordinate	2	49 4	Whole of ordinate	31	39 6
	S	39 2		6	49 4		32	38 2 $\frac{1}{4}$
	R	42 3		10	49 4		33	36 3 $\frac{1}{2}$
	Q	43 8		14	49 0		34	34 3
	P	45 6		18	48 9		35	30 0 $\frac{3}{4}$
Half of ordinate	O	23 3	Half of ordinate	22	46 6	Half of ordinate	36	23 4 $\frac{1}{2}$
				26	22 1		37	3 6
Area of the knee		319 9			533 8	Area of post and rudder		395 3
		3 0	x by distance between the		11 0			10 4
		322 9	ordinates					405 7
x by distance between the		2 9			5870 4	x by distance between		2 9
ordinates					1115 4 $\frac{1}{2}$	the ordinates		
		887 6 $\frac{3}{4}$			887 6 $\frac{3}{4}$			
Area of the load-water-line is					7873 3 $\frac{1}{4}$	Area		1115 4 $\frac{1}{2}$
Area of the upper horizontal line is					7721 10			
					$\frac{1}{2}$)15595 1 $\frac{1}{4}$			
Mean area					7797 6 $\frac{5}{8}$			
Multiplied by mean depth					0 6			
Gives solid feet					3898.776			
Which multiplied by pounds in a cubic foot of salt-water					64.375			
Gives					250983.725			
Number of pounds displaced below upper horizontal line					608615.1678			
Divide by pounds in a ton					2240)6337135.403			
Total displacement of the ship under the load-water-line					2829 tons 175lbs.			

We now find that the 74-gun ship, *Plate I.*, load-water-line, is not only properly placed with regard to her best failing trim, but the displacement also agrees with the estimated weight of the whole ship when fit for sea, which was 2810 tons 745 lbs., or exceeds it by 18 tons 430 lbs., which is better; as the bias should rather lead to increase than diminish in capacity, and favours any little inaccuracies in the admeasurements; though surely there is little room for error in either extreme, if proper attention be paid to the subject. In like manner may, therefore, the weight of any other ship be found; and, by reducing the displacement of the bottom into cubic feet, we may always ascertain if the load-water-line in the draught be properly placed.

Stability, or Stiffness.

The stability or stiffness of a ship comes next under consideration, being a quality no less essential to the safety of navigation than capacity; and without which a ship is totally disqualified for the purposes of war, being unable to use her guns with effect, or carry a press of sail in case of emergency.

Before we proceed further, the following particulars, as they relate to vessels at rest, or in motion, should be defined.

The *centre of cavity, or displacement*, already mentioned, is the centre of gravity of the volume of water displaced by the immersed part of the ship's bottom; and is also the

centre of all the vertical force that the water exerts to support the vessel; for as heavy bodies by their gravity endeavour to approach the centre of the earth in a vertical line, passing through their centre of gravity, tending directly towards the centre of the earth; so the pressure of fluids endeavours to carry bodies in a vertical line tending from the centre of the earth towards their surface, and passing through the centre of gravity of the immersed part, which forces them towards the surface; so also in any immersed body at rest these two opposite forces coincide in the same vertical line, acting in a quite contrary direction to one another. Thus, every floating body is necessarily supported, or pressed upwards, by the fluid with a force equal to its weight, or pressure downwards, otherwise no body could remain at rest on a fluid, but would ascend or descend as the prevailing force determined: and the moments of all the forces with which a floating body presses on a fluid, and the moments of the forces of the fluid which supports the floating body, are equal and contrary, and are resolved into the same right line, perpendicular to the plane of the fluid. But as this centre depends upon the shape of the body immersed, it of course varies with every inclination of a ship; and whilst the centre of cavity goes faster, and further over to the ship's side in her motions, so as to keep without the perpendicular of the centre of gravity, the ship will be supported; and the water will act upon the centre of cavity

SHIP-BUILDING.

cavity in the immerged body with more or less power, in proportion to its distance without the centre of gravity, to bring the ship upright, where the acting force or power ceases which occasioned the vessel to heel.

The *line of support* is the vertical or perpendicular line supposed to pass through the centre of gravity, and intersecting a line perpendicular to the keel of the vessel through the point, called the *meta-centre*. For if a floating body is inclined by any power which does not change the position of its centre of gravity, the line of support must necessarily pass between that power and the centre of gravity; and the force or moment of that power is equal to the weight of the floating body, multiplied into the distance of its centre of gravity from the line of support. As the line of support must pass between the centre of gravity and the power applied to heel the vessel, the moment of that power, or its force, multiplied into its distance above the meta-centre, is equal to the moment of its gravity, or the weight of the floating body multiplied into the distance of the centre of gravity below the meta-centre.

Suppose the vessel inclined, or heeling by the power of the wind on the sails, if the line of support passes on the windward-side the vessel would upset, as the power and gravity are at the same side operating to incline it; but if it passes to the lee-side of that power, the vessel will be redressed, as the power and weight operate to that effect; and if the moments of the power and gravity be not equal, the body will not remain at rest, but will incline more or less, as the power or the weight prevail.

Hence it is plain, that the distance from the centre of gravity to the line of support, multiplied into the weight of the vessel, is the measure of the stability of the vessel, or its effort to redress itself when inclined, and that its stability is as that distance.

The *meta-centre* usually signifies a point to which, if the centre of gravity of a floating body be raised, the smallest lateral effort will make it incline. It is plain, that in an homogeneous cylinder, or sphere, the meta-centre, and centre of gravity, being always in the same point or centre of the sphere, however these bodies are inclined, have no stability. The centre of gravity must, by no means, be placed above the meta-centre, because if it were the vessel would overset. This centre, which has likewise been called the *shifting centre*, depends upon the situation of the centre of cavity, for it is that point where a vertical line drawn from the centre of cavity intersects a line passing through the centre of gravity, and being perpendicular to the keel.

The *centre of gravity* of a ship, is that point by which it may be suspended, and the parts remain in perfect equilibrium. It is also the centre of all the forces, or momenta, which press it vertically, or directly downwards towards the centre of the earth.

The lower the centre of gravity is placed, the farther is it from the line of support, and consequently the greater stability.

In ships of war, the centre of gravity can never be far removed from the load-water-line; for if the centre of gravity could be placed nearer the keel, it is not to be desired, as the farther it is removed from the load-water-line, the rolling of the ship becomes more uneasy.

The *centre of motion* is that point upon which a vessel oscillates or rolls when put in motion. This centre is always in a line with the water's edge, when the centre of gravity is even with, or below the surface of the water; but whenever the centre of gravity is above the water's surface, the centre of gravity is then the centre of motion.

The *longitudinal axis* of a ship is an imaginary line, which passes horizontally from head to stern through the centre of gravity.

The *transverse axis* is an imaginary horizontal line, passing athwartships through the centre of gravity.

The *vertical axis* is an imaginary perpendicular line, drawn through the centre of gravity when the vessel is in equilibrium.

It is about these axes that every ship or vessel in motion may be supposed to turn. In rolling, she may be supposed to oscillate on the *longitudinal axis*; in pitching, on the *transverse axis*; and in working, &c. to turn on her *vertical axis*.

From constantly observing that the performance of ships at sea depends materially on their stability, both naval architects and navigators must, at all times, be desirous of discovering in what particular circumstances of construction this property consists, and according to what laws the stability is affected by any varieties that may be given to their forms, dimensions, and disposition of contents; which are determined, partly according to the skill and judgment of the constructor, and partly, in some vessels, as we shall shew, by adjustments after the vessel is afloat.

The form of the immerged body, and the weight of the ship, are the chief terms in the composition of stability, and they are only to be attained, in the requisite degree, by full dimensions near the load-water-line, with sufficient capacity.

At first sight, it is certain that all the weight above the load-water-line helps to make the ship crank, and, of consequence, the lighter the upper works the stiffer the ship.

Constructors may vary the form of a ship chiefly in three dimensions, that is, in the length, breadth, or depth: let us examine how far enlarging of ships, in any of these particulars, will contribute toward making them carry sail, or, in other words, gain stability; for although the wind may, in one sense, be said to constitute the power by which ships are moved forward in the sea, yet if it acts on a vessel deficient of stability, the effect will be to heel the ship rather than to propel it forward; stability is, therefore, not less necessary, than the impulses of the wind are to the progressive motion of vessels.

If the *length* only, without altering the other dimensions, be enlarged, the centre of gravity and the meta-centre will continue the same height, and her stability in respect of inclination to one side will increase in proportion to the weight of the ship; and as the weight generally increases or diminishes in proportion to the length, we may say that in ships that differ only in length, their stability will be in proportion to their length.

Yet although an increase of length would enable a ship to carry the most sail, consequently sail faster, it must not be carried to an extreme; because if so constructed, a ship would neither tack nor veer so quickly; neither would the lift or rise in a sea like one shorter; she would strain more, and be very liable to have the sea break over her. The influence of the rudder may be weakened, and may even be totally lost. The greatest judgment is therefore required in proportioning the length, which may be proportionally greater in those ships that generally navigate in the smoother seas, or are not intended to be deeply laden.

By altering the *breadth*, the stability is materially affected; for by enlarging it we gain, and by diminishing the breadth we lose a great deal of the stability. M. Bouguer has proved, that the stability increases in proportion to the cubes of the breadths: for, supposing the bottom homogeneous, then, 1st, the increase of weight, and of consequence stability, will be double the increase of the breadth; and 2dly, the additional weight will act with so much the greater force, as the length of the lever is increased, or as the meta-centre is raised, and the height of that point is augmented in proportion to the square of the breadth: hence the stability will

SHIP-BUILDING.

will be increased in proportion to the cube of the breadth; for example, without altering the other dimensions, let the breadths be doubled, we thereby double the weight, which, by acting upon the arm of a lever, double the length will be quadruple, so the ship will acquire eight times the stability.

Thus we see an increase of breadth will produce an increase of stability; for a ship that is broad and shallow has much more stiffness than one that is narrow and deep; but the sailing of the ship may be much retarded, as she certainly would be leewardly under little sail, which ought to be particularly guarded against, especially in constructing large ships of war. The expence in the building would also be materially increased, according to the usual mode of computing the tonnage, as may be readily seen in the next section.

If the *depth* only is increased, without enlarging either the length or breadth, all the stability that can be gained will be in the stowage. To increase the depth or draught of water would lower the centre of gravity, and increase the weight; this would operate against velocity, because the resistance is as the quantity of water to be removed; or nearly as the area of the thwartship section of the immersed part of the body at the midship-bend. It would at the same time render the immersed body of a figure less proper to separate the line of support from the centre of gravity, so that the effect on one side would be in some measure destroyed on the other; and, by lowering the centre of gravity too much, the ship would labour excessively, and endanger the masts, too large a draught of water being both dangerous and inexpedient.

Ships having a sufficient degree of stability arising from their construction, will certainly sail faster than others, which, in order to carry the same quantity of sail, require to be ballasted with a much greater weight; for the latter, so ballasted, will be much more liable to roll than the former.

The following circumstance will prove, that instability in the construction cannot be rectified to any considerable degree by the stowage, although, on the contrary, that the stability of many ships, however perfect in construction, may be materially injured by improper trim, or an injudicious mode of stowage.

And, first, as there is nothing of more importance to the well-being of a ship than its stability, it will not be improper to mention an opinion which prevails with seamen in general, that the stability depends chiefly on the stowage of the hold; and at the same time, in order to shew that a very great change in that respect will produce a very trifling difference in the stability, we shall quote a professional author of great merit, M. de Romme, in his book *L'Art de la Marine*, page 105. "As to the position of the centre of gravity, no doubt it may vary, but the limits to which it is confined are very straight, especially in ships of war. An example in the *Scipio*, of 74 guns, armed for the first time in 1779, was hardly in the road before she was suspected of instability. It was important in time of war to clear up those doubts, and to make the necessary experiments to prove this dangerous defect, if it existed. First, the lower-deck guns were run out on one side, while hoisted on the other, which heeled the ship thirteen inches; the ship's company were then ordered to their quarters at the side the guns were out, which increased the inclination to twenty-four inches. After these essays the sails were set, and in fine weather the ship was found to crank, as to render the use of the lower-deck guns difficult and dangerous: thus, her instability being proved, she was ordered to port to be remedied.

"Opinions were divided as to the cause of the defect; some imagining it to proceed from the form of the hull; others from the ill arrangement of the charge. The first engineer was ordered to attend at Rochfort, and direct the choice of measures to give the *Scipio*, as well as two other

ships, the *Pluto* and *Hercules*, built from the same plan, the stability they wanted. He judged that new stowage would remedy the defect, and his opinion was adopted by the marine council. The *Scipio* was unloaded, and charged anew, under the direction of the chief engineer. In the first charge she had 84 tons of iron, and 100 tons of stone ballast, and was re-loaded with 198 tons of iron, and 122 tons of stone ballast; and as her draught of water, or displacement, could not be altered, it was necessary to diminish 130 tons of water to preserve the same line of floatation; by this means 136 tons were placed, in the second loading, eight feet lower than in the first; yet when the ship was completed with the new distribution of her charge, she was found precisely as deficient as before, inclining twenty-four inches, with the men at quarters, and the guns out. She was afterwards doubled with light wood, a foot thick at the extreme breadth, and ten feet under water, decreasing to four inches length and depthways."

M. de Romme very judiciously observes, that the defect of instability was not so much owing to a want of extreme breadth, as several other 74-gun ships had had the same, or even less, but in diminishing the breadth at the plane of floatation too quickly forward and aft, which at once lessened the capacity and position of the line of support.

A French 36-pounder weighs, with carriage, &c. $4\frac{1}{2}$ French tons, and their increased length causes their centres of gravity, when run out, to be removed $4\frac{1}{2}$ feet; so that the moment produced by running out the lower-deck guns of a French 74, the opposite side hoisted, is more than double the moment for an English 74, in the same circumstance.

It is certain this change of place in the centre of gravity, which lowered it nearly five inches, must have contributed to increase the stability, and have occasioned nearly a difference of three inches in the greatest inclination; but as the experiment where the men are stationed at quarters is liable to such irregularity, an error of this magnitude is to be accounted for from the men running to the side, to mark more strongly the defect of a bad ship.

Secondly, the stability of many ships, however perfect in the construction, may be materially injured by an improper trim, or an injudicious mode of stowage; for was the centre of gravity raised too high by the weightiest part of the cargo being placed uppermost, the ship would not only be rendered incapable of carrying a sufficient quantity of sail, but in danger of being overset; and was the cargo lead, or any other such weighty body, and placed too low in the hold, the centre of gravity would consequently be so lowered as to endanger the ship's rolling away her masts. When a ship is so loaded, as that her centre of gravity is carried too far forward, the ship will pitch and labour heavily; and when too far off, she will occasionally be exposed to the dangerous circumstances of a pooping sea, &c.

As it is of the utmost importance to the well-being of a ship to ascertain its stability, the greatest attention must be given, in the construction, to the finding of the exact distance, between the meta-centre and centre of gravity, that every ship requires, according to her form; the maximum of which is, that the ship shall not, by the length of lever, either become too stiff, or be subject to sudden motion or rolling; nor, on the contrary, from the lever's being too short, the vessel is unable to carry sail. Therefore, in the construction, to ascertain the height of the meta-centre above the centre of gravity of the immersed part of the bottom, the half section of the load-water-line must be taken as was divided to find the displacement. Then the sum of the cubes of the half sections, or ordinates, is to be multiplied by the distance between them, and two-thirds of the product

SHIP-BUILDING.

product are to be divided by the immerfed part of the bottom of the fhip.

It is hence evident, that while the fection at the water-line

is the fame, and the volume of the immerfed part of the bottom remains alfo the fame, the altitude of the meta-centre will remain the fame, whatever may be the form of the bottom.

Operation.

Names and Lengths of the Ordinates at the Load-water-Line, in Feet and Decimal Parts.		Cubes of the Ordinates.	Names and Lengths of the Ordinates at the Load-water-Line, in Feet and Decimal Parts.		Cubes of the Ordinates.	Names and Lengths of the Ordinates at the Load-water-Line, in Feet and Decimal Parts.		Cubes of the Ordinates.
27	21.62	10084.09	O	23.25	12568.02	P	22.75	11774.49
28	21.25	9595.70	K	24.12	14032.29	Q	21.83	10403.06
29	20.91	9142.44	F	24.58	14850.66	R	21.12	9420.57
30	20.20	8242.40	B	24.66	14996.	S	19.58	7506.38
31	19.75	7703.73	(1)	24.66	14996.	T	18.18	6008.67
32	19.09	6956.93	2	24.66	14996.	U	16.02	4111.37
33	18.14	5968.96	6	24.66	14996.	W	13.25	2326.17
34	17.12	5017.70	10	24.66	14996.	X	9.75	926.83
35	15.03	3395.27	14	24.5	14706.12	Y	5.33	151.42
36	11.68	1593.38	18	24.37	14473.09	Stem	0.83	.57
37	1.75	5.35	22	23.25	12568.02	Knee	0.79	.49
Post	0.91	0.753	26	22.08	10764.44			
Rudder	0.89	0.704						
		67707.407			168942.64			52630.02
× by diftance between the ordinates -		2.75	× by diftance between the ordinates -		11.0	× by diftance between the ordinates -		2.75
Sum		186195.35			1858369.04	Sum		144732.55
					144732.55			
					186195.35			
Sum of the products		-			2189296.94			
					2			
					3)4378593.88			
Cubic feet of falt-water difplaced by the bottom		98436.07			1459531.29			(14 ft. 9 $\frac{3}{4}$ in.
					81426.31			
					12			
					977115.72			
					91191.09			
					8			
					729528.72			

The above operation gives 14 feet 9 $\frac{3}{4}$ inches, the height of the meta-centre above the centre of gravity of the immerfed part of the bottom of the 74-gun fhip, *Plate II.*

Now let us fee how the above calculations in determining the height of the meta-centre above the centre of gravity agrees with actual experiment; for theory (particularly in the conftituting of fhips) that agrees with experiment is only

to be regarded. We are in this particular indebted to the late admiral Levefon Gower, who directed feveral experiments to be made to try the relative ftability of the following fhips of war, by heeling them with their lower-deck guns out on one fide, and houfed on the other; and afterwards with their men at quarters, the guns remaining as above.

	Formidable, 98 guns.		Barfleur, 98 guns.		Brunfwick, 74 guns.		Bedford, 74 guns.		Bombay Cafle, 74 guns.	
	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
Draught of } afore	22	0	23	10	20	7	21	3	21	0 $\frac{1}{2}$
water } abaft	23	3	23	11	21	4	22	4	22	9
Gun-deck port in midfhips above the water	5	6	4	6	5	4	5	2 $\frac{1}{2}$	5	1 $\frac{1}{2}$
Heeled by the guns only	0	3 $\frac{1}{2}$	0	3	Not mentioned.				0	3
Ditto by the men at quarters	1	2	1	0	0	11	0	11 $\frac{1}{2}$	0	8

SHIP-BUILDING.

As the inclinations of the Brunswick and Bedford are omitted in the first experiment, we shall only compare the relative stability of the other three ships, which are quite sufficient to explain every thing necessary to be remarked on the subject. It is to be regretted that the first inclination of the Brunswick was omitted, as it comes the nearest to Plate I.

The estimated weight or displacement the	{ Formidable	3150	} Tons.
	{ Barfleur *	3360	
	{ Bombay Castle	2700	

* The difference of the draught of water of the Formidable and Barfleur, $14\frac{1}{2}$ inches, gives at least 210 tons difference in the weight. Both ships have similar dimensions nearly, and are supported on an even keel.

These three ships have the same number and weight of guns on the lower gun-deck; therefore the moment of the guns, whether quite exact or not, does not signify, as any error will not have a partial influence. We suppose each gun and carriage together to weigh three tons, and allow three feet removal when the gun is run out; and as there are 14 guns run out in each ship, the equal moments for them is $3 \times 3 \times 14$, or 126 tons at three feet: the weight on one side the balance is 42 tons, at three feet distance from the support; and on the other, in the Formidable, 3150 tons, at 48 hundredths of an inch (less than half an inch), which will be found to balance 42 tons at three feet:—for the Barfleur 3360 tons, at 45 hundredths of an inch, which will balance 42 tons at three feet; for the Bombay Castle 2700 tons, at 56 hundredths of an inch, which will balance 42 tons at three feet.

Having found the distance each centre of gravity is separated from the line of support, which is in these small inclinations the same as the sine of the angle; the cosine, or distance of the centre of gravity from the meta-centre, is easily known, and will be found to be, for the

	Ft.	In.	
Formidable's centre of gravity	3	$5\frac{1}{10}$	} below the meta-centre.
Barfleur's	3	$9\frac{2}{10}$	
Bombay Castle's	4	$5\frac{1}{10}$	

When the Formidable and Barfleur were farther inclined by the men at quarters, the Barfleur continued to have one-seventh more stability than the Formidable; which proves that the Formidable's centre of gravity was above the line of floatation; for otherwise, as her immerfed body was better calculated to separate the line of support from the centre of gravity than the Barfleur's, she would have inclined less proportionably, if the centre of gravity had not acted against her stability: 100 tons of iron ballast at the keelson would have only increased her draught of water six inches, and have given her more stability than the Barfleur, leaving her the advantage of six inches more height for her ports, and nearly 34 feet square less resistance at her mid-ship-bend. Thus it is demonstrable, that those ships should have no more shingle ballast than is necessary for the ground tier, and should have above 200 tons of iron; nor would there be any danger of their being labourfome, as their centre of gravity would be but at the line of floatation or load-water-line. The same regulation should prevail with the first-rates.

The Bombay Castle is certainly stiff enough, yet no doubt her lower deck might have been placed six inches higher without any detriment whatever to the ship, and her ports would of consequence have been at a reasonable height from the water.

In Plate I. we find, by the preceding calculations, that the

centre of gravity of the immerfed part of the bottom was above the under side of

	Ft.	In.
The keel	11	$0\frac{1}{2}$
The meta-centre above the said centre of gravity	14	$9\frac{7}{8}$
	25	$10\frac{1}{8}$

And the centre of gravity is four inches above the load-water-line at the centre of cavity, which makes it

Centre of gravity below the meta-centre	5	0
---	---	---

Which we find exceeds the Bombay Castle's; and the ports in Plate I. are five feet eight inches above the water.

By the above experiment we observe, that the guns being run out on one side and housed on the other, inclined the ship to a certain point, and at the same time there was an exact equilibrium between the momentum of the guns, and the whole weight of the ship on each side the line of support in the direction of the vertical effort of the water. The centre of gravity of the ship is in the same vertical line with the meta-centre when the ship is in an horizontal position; and the more the ship inclines, the more will the centre of gravity of the ship be removed from the vertical line of the meta-centre, or line of support. Hence it is plain, that the distance of the centre of gravity from the line of support is always in proportion to the sine of the inclination; at least when the inclination is but small, as before observed. Now, if that distance, and likewise the whole weight of the ship, be known, we have also its momentum, or the relative force with which that weight acts in endeavouring to right the ship, and bring her again into an horizontal position, and which is the measure of her stability; but since both the situation, and likewise the weight that produces the inclination, are known, we may thence know if the momentum of one be equal to that of the other, and thereby easily discover if the centre of gravity be in that very point we propose.

The success of the above experiment (which might be rendered very useful if more frequently tried) depends on the nicety to be observed in taking the exact quantity of the angle of inclination: to attain this, a level line for the sensible horizon of the sea may be used, or, what is much better, a plumb-line fastened to the head of the mast, taking its distance from the heel of the mast, both when the ship is upright, and likewise when she heels. The plumb-line seems to be the most convenient, because we have thereby immediately the proportion in which the centre of gravity recedes from the vertical line of the meta-centre, which will always be in proportion to the distance of the plumb-line from the heel of the mast. During the whole time of the operation, it is necessary to be very careful to render all the circumstances absolutely the same, so as to be well assured the inclination is produced only by the momentum of the guns, &c.

We may in this manner prove the centre of gravity of the 74-gun ship, Plate I., knowing the height of the meta-centre; for, having the quantity of the weight producing the inclination, (which is the same as the above,) and examining the distance of the centre of gravity from the line of support in which the effort of the water exerts itself, we have also its momentum, or its relative force, which is equal to the whole ship, since these two exactly balance one another; so that it is only dividing this momentum by the whole weight of the ship, and the quotient will give us the distance of the centre of gravity of the ship from the line of support, or vertical line of the meta-centre.

For the Bombay Castle of 74 guns and 2700 tons, in estimating

SHIP-BUILDING.

Estimating the weight or displacement, it was found, that 56 hundredths of an inch balanced 42 tons at three feet; and it will be found by the following operation, that 53.445 hundredths of an inch in *Plate I.* will balance 42 tons at three feet, *Plate I.*, displacement 2829 tons 175lbs. = $2829.078 \times 53.445 = 151200.0 \div 1200 = 126$.

We now find that the distance of the centre of gravity is removed from the line of support 53.445 hundredths of an inch. After this, it will be easy to discover how far the centre of gravity is below the meta-centre, since there will be the same proportion betwixt the distance of the plumb-line from the heel of the mast, and the height of the mast, that there is betwixt the distance of the centre of gravity from the line of support. Thus, the length of the mast is 112 feet, which multiplied by 53.445 = $5985.8 \div 1200 = 4$ ft. 11 $\frac{1}{2}$ in., the distance of the centre of gravity below the meta-centre nearly agrees with the calculation above given.

Tonnage or Burthen.

By the tonnage of a ship, is meant to convey the idea of the *weight of the cargo* she is intended to carry from her light to her load water-line, or seat in the water, when best equipped for sea. It may also be called the ship's *real burthen*. Therefore, to ascertain the true burthen or tonnage by calculation, is a question of equal importance and difficulty, as preceding displacement, &c.

It is of importance, because it is by this that the merchant or freighter judges of the fitness of the ship for his purpose; and although customary rules are given for computing the tonnages of ships, the bare inspection of them will prove how futile they are. It would be very difficult to fix upon any general rule which shall be very exact, because it depends not only on the cubical dimensions of the ship's bottom, but also on the scantling of her whole frame; and, in short, on the weight of every article to complete the said ship ready to receive on board her cargo. The weight of timber is variable; the scantling of the frame being no less so.

The following rules for computing the tonnage of a ship are commonly adopted and made use of between the contractor and the builder, at a certain rate *per ton* for the building, and will be found to be quite unconnected with the above definition of a ship's tonnage; for as the depth is out of the question, the contractor finds a saving in less breadth and great depth, which make against stability, and consequently injure the velocity: on the contrary, great breadth and less depth will be found more advantageous to the builder: thus are the interests of the two parties oppositely concerned in the result, and both, when carried to the extreme, are exceedingly injurious to the construction of vessels.

The general Rules observed for measuring the Tonnage of Ships in the Royal Navy and the Merchants' Service.

Let fall a perpendicular from the fore-side of the stem, at the height of the upper deck, or middle deck, in three-deck ships, and another perpendicular from the aft-side of the main-post, at the height of the wing-transom. In merchant-ships, the foremost-perpendicular is let fall from the fore-side of the stem, at the height of the wing-transom. From the length between these perpendiculars, deduct three-fifths of the extreme breadth, (that is the thickness of the bottom plank on each side added to the moulded-breadth,) and likewise as many 2 $\frac{1}{2}$ inches as the wing-transom is above the upper edge of the keel, and the remainder is reckoned the length of the keel for tonnage.

Then multiply the length of the keel for tonnage by the extreme breadth, and that product by half the extreme breadth; then dividing by 94, the quotient will be the burthen, in what may be denominated builder's tonnage.

Calculation of the burthen in tons of the 74-gun ship, *Plate I.*, according to the common rule.

	Ft.	In.
Length from the fore-side of the stem, at the height of the upper deck, to the aft-side of the main-post, at the height of the upper side of the wing-transom	182	9 $\frac{1}{2}$
Three-fifths of the extreme breadth is	29	2 $\frac{1}{2}$
The height of the wing-transom is 26 ft. 10 in., which produces for every 2 $\frac{1}{2}$ inches	5	6 $\frac{1}{2}$
	34	9 $\frac{1}{2}$

Length of the keel for tonnage	-	-	148	0
Multiplied by the extreme breadth	-	-	48	8
			7202	8
Multiplied by half the extreme breadth	-	-	24	4
Divided by 94	-	-	175248	0
Burthen in tons, according to the common rule	-	-	1864	$\frac{3}{4}$

Estimate, shewing the real burthen of the 74-gun ship, *Plate I.*

	Tons.	lbs.
The weight of the ship at the launching draught of water	1377	2198
The weight of the furniture, including the sheathing	204	1040
The weight of the ship at her light water-mark	1582	998
The weight of the ship at the load water-mark	2829	175
From which deduct the weight at the light water-mark	1582	998
Real burthen	1246	1417
Burthen in tons, according to the common rule	1864	762
Difference	617	1585

By the above it may be readily seen, that the 74-gun ship (*Plate I.*) will not carry the number of tons she is rated for, by 617 tons 1585 lbs.; and hence the impropriety of such a rule being made general, as it will always be found greatly to increase the tonnage of sharp-built vessels; while those that are full-built, as ships in the East India Company's service, will carry a great deal more. We shall, therefore, calculate the tonnage of the East India ship (*Plate XII.*) both ways as above, in order to prove the great inaccuracy of the rules with respect to those vessels, as well as to ships of war.

SHIP-BUILDING.

Calculation of the burthen in tons of the East India ship, (Plate XII.) according to the common rule.

	Feet.
Length from the fore-side of the stem, at the height of the upper side of the wing-tranfom, to the aft-side of the main-post, at the said height of wing-tranfom, is - - - - -	159
Three-fifths of the extreme breadth is - - - - -	22.6998
The height of the wing-tranfom is 24 feet, which produces for every 2½ inches - - - - -	5
	27.6998
Length of the keel for tonnage - - -	131.3
Multiplied by the extreme breadth - -	37.8333
	4967.5122
Multiplied by half the extreme breadth -	18.9166
	93968.
Divided by 94 - - - - -	
Burthen in tons, according to the common rule - - - - -	999 $\frac{2}{3}$

Estimate, shewing the real burthen of the East India ship, Plate XII.

	Tons.	lbs.
The weight of the ship at the launching draught of water - - - - -	748	1071
The weight of the furniture, including the sheathing - - - - -	62	1782
The weight of the ship at her light water-mark - - - - -	811	613
The weight of the ship at her load water-mark - - - - -	2029	597
From which deduct her weight at the light water-mark - - - - -	811	613
Real burthen - - - - -	1217	2224
Burthen in tons, according to the common rule, as above - - - - -	999	1477
Difference - - - - -	218	747

We now find that the East India ship will carry 218 tons 747 lbs. more than she is rated for by the common rule; which, it plainly appears, is in consequence of her body being formed so full; and the greater the contrast between full and sharp bodies, the greater will be the error in the tonnage cast by this rule; which shews the impropriety of the erroneous method practised for casting a ship's tonnage.

Hence it is obvious, that no dependence can be placed on the common rules for ascertaining the true tonnage of vessels. Indeed we neither have, nor expect to have, any rule that shall be quite exact; because the tonnage depends not only upon the cubical dimensions of the ship's bottom, but also on the weight and scantling of her

whole frame. For instance, a ship built at Archangel of fir, will carry considerably more than another of the same plan in every respect, built at the Havannah of live oak; nor is there a greater difference in some ships, when the weight of every thing which properly makes a part of the ship, as to the fastening, &c. &c. is considered. We must, therefore, be contented with a rule that approximates nearer to the truth; and such is the following, proposed by the late Mr. Parkyns, of Chatham-yard.

Rule 1. For sharp ships, particularly those of the royal navy.

1st. Take the length on the gun-deck, from the rabbet of the stem to the rabbet of the stern-post, or between the perpendiculars. Then take $\frac{2}{3}$ ths of this length, and call it the *keel for tonnage*.

2dly. To the extreme breadth add the length of the gun-deck, or length between the perpendiculars. Then take $\frac{1}{3}$ d of this sum, and call it the *depth for tonnage*.

3dly. Set up this depth from the limber-strake; and, at that height, take a breadth also from out to outside of the plank at dead-flat, and another breadth between that and the limber-strake: add together the extreme breadth and these two breadths. Take one-third of the sum, and call it the *breadth for tonnage*.

Lastly. Multiply the length for tonnage by the depth for tonnage, and the product by the breadth for tonnage, and divide by 49. The quotient will be the burthen in tons nearly.

The following trials have been made, to prove the accuracy of this rule.

Ships' Names.	Guns.	Tonnage by the King's or common Rule.	Tonnage by Mr. Parkyns's Rule.	Tonnage actually received on board.
Victory -	100	2162	1839	1840
London -	90	1845	1575	1677
Arrogant -	74	1614	1308	1314
Diadem -	64	1369	1141	965
Adamant -	50	1044	870	886
Dolphin -	44	879	737	758
Amphion -	32	667	554	549
Daphne -	20	429	329	374

Rule 2. For ships of burthen, or commercial ships in general.

1st. Take the length of the lower deck, from the rabbet of the stem to the rabbet of the stern-post. Then take $\frac{3}{4}$ ths of this length, and call it the *keel for tonnage*.

2dly. To the extreme breadth add the length of the lower deck. Then take $\frac{2}{5}$ ths of the sum, and call it the *depth for tonnage*.

3dly. Set up this depth from the limber-strake; and, at that height, take a breadth also from out to outside of the plank at dead-flat; take another at two-thirds of this height, and another at one-third of the height: add the extreme breadth and these three breadths together, and take one-fourth of the sum for the *breadth for tonnage*.

Lastly. Multiply the length for tonnage by the depth for tonnage, and the product by the breadth for tonnage, and divide by 36.6666 or $36\frac{2}{3}$; and the quotient will be the burthen in tons.

The following trials, among many others, shew that this rule does not deviate much from the truth.

Granby,

SHIP-BUILDING.

	Tonnage by the King's or common Rule.	Tonnage by Mr. Parkyn's Rule.	Tonnage actually received on board.
Granby, East India } ship - - - }	786	1179	1179
Northington, do. -	676	1053	1064
Union, a collier -	193	266	289
Friends Goodwill, do.	182	254	277

The general rule for calculating the loading of colliers is as follows:

From the length of the keel subtract 6 or 7 feet for the dead stowage fore and aft; multiply the remainder by the breadth at the midship-frame, and that product by the depth of water the ship draws when loaded; divide this by 96, and you will have the number of London chaldrons the ship will carry.

A method of constructing a scale of solidity, by which may be ascertained the quantity of water displaced at any given draught, and the weight required to bring the ship down to any draught of water proposed.

In order to construct this scale for any ship, it is requisite, in the first instance, to calculate the quantity of water displaced by the bottom, below each water-line, and by the keel, in the same manner that we have already done for the 74-gun ship (Plate I.); for which ship, as the areas of the several water-lines are already calculated, a scale of solidity may be readily constructed as follows:

Construct a scale of equal parts, to represent tons, as the scale so marked in Plate XIV.; and another to represent feet and inches, as that below it. The larger these scales, the more exact will be the performance.

Water-Lines, &c.		Height.	Water displaced in		
		Feet.	Cubic Feet.	Tons.	Lbs.
Keel and false keel	- - - -	2.0 = C	531.5	15	615
Between the keel and first water-line	- - - -	3.6	7254.881	208	1113
	Sum - -	5.6 = D	7786.381	223	1728
Between the first and second water-lines	- - - -	3.6	15992.156	459	1335
	Sum - -	9.2 = E	23778.537	683	823
Between the second and third water-lines	- - - -	3.6	20345.850	584	1604
	Sum - -	12.8 = F	44124.387	1268	187
Between the third and fourth water-lines	- - - -	3.6	33824.350	684	1532
	Sum - -	16.4 = G	67948.737	1952	1719
Between the fourth and fifth water-lines	- - - -	3.6	26593.425	764	592
	Sum - -	20.0 = H	94542.162	2717	71

Now set off the tonnages from the above table upon the corresponding water-lines, &c. in Plate XIV. fig. 1, thus: upon C, representing the upper side of the keel, set off, from the perpendicular A H, 15 tons 615 lbs., taken from the scale of tons, equal to Cc. Upon the line D, or lower water-line, set off 223 tons, 1728 lbs. equal to Dd. Upon the line E, or second water-line, set off 683 tons 823 lbs. equal to Ee. In like manner, set off the other tonnages upon their corresponding water-lines: then through the points Cc, Dd, Ee, Ff, Gg, Hh, draw the curve AS, which will represent the solidity of displacement at any given height.

Draw the line A B, representing the lower side of the keel; and at A square up a perpendicular. Then set up from A B, the depth of the keel and false keel from the sheer-draught, Plate I.; likewise all the water-lines, D, E, F, G, H, as shewn in Plate XIV. fig. 1, parallel from the line A B.

The following table is formed by the preceding calculations.

Thus, the first column is obtained merely by first inserting the depth of the keel and false keel, and adding, successively, the distance each water-line is apart.

The second column is obtained by first taking, from the foregoing calculations, the cubical contents of the keel and false keel, which is 531.5 feet, as shewn in the table at C.

Then find the cubical contents between the upper side of the keel and lower water-line, by finding the mean area, and multiplying it by the distance of the water-line above the keel, which is 3.6 feet, and we have 7254.881, the displacement between the lower water-line and the keel: add this number to the former, and the whole will be 7786.381, the displacement at the lower water-line, or D.

Again, find the mean area of the first and second water-lines 4442.2655, and multiply it by the distance between the water-lines (3.6 feet), and add the product to the former. The sum will be 23778.537, the displacement at the second water-line, or E.

In like manner, find the mean area of the second and third water-lines, and multiply it by the distance between. Add the product to the former, and it will produce 44124.387, the displacement at the third water-line, or F. Thus proceed with the rest.

The third column is to be filled up by multiplying each line of the second column by the weight of a cubical foot of sea-water ($64\frac{1}{2}$ lbs.), and dividing the product by 2240, the number of pounds in a ton; which will, of course, give the weight in tons and pounds, as in the table.

For example, the 74 (Plate I.) draught of water, when launched, was 13 feet forward and 17 feet abaft; which gives 14 feet 3 inches at dead-flat, or midships, the ship's chief support in this light state. Take, therefore, 14 feet 3 inches from the scale of feet, and set it up parallel from the line A B, or lower side of the keel, to intersect the curve of displacement, as at Ii. Take the nearest distance from the intersection of the curve to the perpendicular A H, and apply it on the scale of tons, and it gives 1550 tons 1120 lbs. But by the estimate, the weight of the ship, at her launching draught of water, was 1377 tons 2198 lbs., which exceeds the above by 172 tons 1162 lbs.; but that may

SHIP-BUILDING.

may be easily accounted for, by the weight of anchors, cables, men, ballast, &c. as additional weight in the ship at that time. Take 1377 tons 2108 lbs., the weight of the hull exclusively, from the scale of tons, and set it off from the perpendicular line AH , along the line AB , or base; whence square up the perpendicular Kk , to intersect the curve of displacement. That depth we find by the scale of feet to be 13 feet 4 inches, a difference of 11 inches, accounted for as above.

Now to prove the real burthen of the ship by this scale of displacement, we have found, by the estimate, that the ship, with her furniture, &c. displaces 1582 tons 998 lbs. at her light water-mark. Take 1582 tons 998 lbs. from the scale of tons, set it off as before, and raise the perpendicular Ll to intersect the curve of displacement; and another perpendicular at 2829 tons 175 lbs., taken from the scale of tons, which is the weight of the ship at her load water-line, as Ll . Then take the distance between the two perpendiculars last drawn, and apply it on the tonnage scale, and we have 1247 tons nearly, the real burthen, as before shewn by calculation.

Again, take the height where the perpendicular Ll intersects the curve of displacement, and apply it on the scale of feet, and we have 20 feet 6 inches, the medium height of the load draught of water, which was 20 feet forward, and 21 feet abaft.

Now the perpendicular L being the utmost limit of the quantity of water, expressed in tons, displaced by the bottom of the ship, when she is brought down to her load water-line, it is evident, from what has been already said, that if the number of cubic feet of water which the ship displaces, when light, or, which is the same, the number of cubic feet below the light water-line, be subtracted from the number of cubic feet contained in the bottom, below the load water-line, the quotient will be the real burthen or tonnage.

Any other case to which this scale may be applied is obvious, particularly to merchant-ships. Let it be required to find the number of cubic feet displaced, when the draught of water is 17 feet 7 inches, and the additional number of tons required to bring the ship down to her load water-line.

Take 17 feet 7 inches from the scale of feet, and set it up upon the perpendiculars AN and Ll , above the base line AB , and draw an horizontal line through those spots, intersecting the curve of displacement at o ; from thence drop the perpendicular Oo . Take the distance o , in the horizontal line, to the perpendicular AN , and apply it on the tonnage scale, it will measure 2205 tons 1706 lbs., the displacement answerable to that draught of water; and the measurement from o , taken to the perpendicular Ll , applied on the tonnage scale, will give 623 tons 708 lbs., the additional weight necessary to bring the ship down to the load water-line. Again, 623 tons 708 lbs. added to 1582 tons 998 lbs., give 2205 tons 1706 lbs., as above, and thus it is proved that the perpendicular Oo is equally distant from the perpendiculars Mm and Ll .

The measurement of the tonnage might be facilitated, by drawing the tonnage scale reversed on the base line AB , and at the load water-line, as in the plate.

Now if the draught of water be required, corresponding to any weight intended to be put on board, it may be readily known as follows.

Find the given number of tons, suppose 928, in the scale on the line ml , through which drop a perpendicular to intersect the curve of displacement, as at Pp ; and at p draw an horizontal line. Now the perpendicular distance

between the base line AB , and intersection of p , being applied on the scale of feet, will give 19 feet, the draught of water required.

Many useful discoveries may be made by blocks or models of ships, and with as great certainty as by the nicest calculations; for it must be allowed, as before observed, that in calculating from a draught drawn from a quarter of an inch scale, it will be liable to some inaccuracies, which cannot be obviated in practice, by reason of various little alterations which may be made in laying off the ship in the mould-loft; consequently the draught and the ship will, in those points, disagree. And likewise, upon strict examination, we shall be enabled to find, that there are not many ships that have both their sides exactly equal in every respect.

Let the block, or model, be constructed to a scale of one-quarter of an inch to a foot of the corresponding parts on the ship; and care should be taken to provide the wood as light and dry as possible.

The model being accurately constructed, it may be also proved by suspending it by a line, fastened to a hook in any part of a straight line, drawn from the middle line of the stem to that of the stern-post. This hook may be moved forward and aft to different places in the middle line, and a weight may be suspended from the upper part of the middle line, on the post. If the two sides be exactly of equal dimensions, and homogeneous, they will then be of equal weight. A plane passing through these three lines, whatever part of the middle line the hook be in, will likewise pass through the middle line of the keel, stem, and post: therefore, if the model stands this proof, it will be as true to work from as the nicest calculations.

The model, having stood this test, may be suspended by the same line, or silk, in different positions, until it points out the centre of gravity; which will be found, when the block hangs in a state of equilibrium. This practice is, doubtless, very simple; but it will be found very convenient. Further, the model being suspended by the hook, the lines hanging at the stem and post corresponding to their middle lines, and to that which suspends the block, we may hold a batten out of winding with the line that suspends it, and, with a pencil, draw a line upon it. A plane passing through this pencil line, at right angles to the keel, and passing likewise through the line that suspends the block, will likewise pass through the centre of gravity, which, therefore, must be somewhere in this plane. Again, move the hook to some other part of the middle line, and let the block be suspended from that point; draw also another pencil line, out of winding with this last line of suspension, and the intersection of the two lines will give the height of the centre of gravity above the keel, and likewise its distance from the post and stem; and if the hook be moved to any other part of the middle line, and a pencil line be drawn as before, it will likewise intersect in the same point; or, let there be ever so many points assumed in the middle line, and the block suspended by each, and pencil lines drawn, they will all intersect in the same point; and as the centre of gravity will always be in that plane which passes through the middle line of the keel, stem, and post, it may with certainty be marked on the draught.

This will certainly require the greatest nicety; but, if well executed, it will agree with that found by calculation, provided the dimensions be taken very exactly, and likewise from a true scale of equal parts.

By the same model may be found the true tonnage of a ship, thus: Let the light and load water-lines be marked on it; then put the model in water, and load it until the surface

face of the water is exactly at the light water-line; and let it be suspended until the water drains off, and then weighed. Now, since the weights of similar bodies are in a triplicate ratio, or as the cubes of their homologous dimensions, the weight of the ship, when light, is, therefore, equal to the product of the cube of the number of times the ship exceeds its model by the weight of the model, which is to be reduced to tons. Hence, if the model is constructed to a quarter of an inch scale, multiply the weight of the model by the cube of 48, (one-fourth of an inch being equal to $\frac{1}{48}$ th of a foot,) or 110592, which will give the weight of the ship. If the multiplier be ounces, the product will be ounces; if pounds, it will be pounds: and it is to be reduced to tons accordingly.

Example.—Suppose the weight of a model of the 74 (Plate I.) to be 32 lbs. 13 drachms, when brought down to the light water-line.

The cube of 48	110592
Multiplied by -	32 lbs. 13 drachms
Produces -	3544560 lbs. = 1582 tons 880 lbs.

The weight of the ship at her light water-mark, within 118 lbs.

Again, let the model be loaded, until the surface of the water is exactly at the load water-line. Now the model being weighed, the weight of the ship is to be found by the preceding rule; then the difference between the weights of the ship, when light and loaded, is the tonnage required.

Upon the Efforts of the Water to bend the Vessel.

Here we can do no better than quote Waton's translation of Euler upon the *Théorie, &c. des Vaisseaux*; to which book we refer our readers for a further illustration of the foregoing particulars, and to Atwood on the Stability of Vessels.

"When we say, that the pressure of the water upon the immersed part of a vessel counterbalances its weight, we suppose that the different parts of a vessel are so closely connected together, that the forces which act upon its surface are not capable of producing any change; for we easily conceive, if the connection of the parts was not sufficiently strong, the vessel would run the risk either of being broken in pieces, or of suffering some alteration in its figure.

"The vessel is in a situation similar to that of a rod *AB* (Plate XIV. *fig. 2.*), which, being acted upon by the forces *Aa*, *Cc*, *Dd*, *Bb*, may be maintained in equilibrium, provided it has a sufficient degree of stiffness; but as soon as it begins to give way, we see that it must bend in a convex manner, since its middle would obey the forces *Cc* and *Dd*, whilst its extremities would be actually drawn downwards by the forces *Aa* and *Bb*.

"The vessel is generally found in such a situation; and since similar efforts continually act, whilst the vessel is immersed in the water, it happens but too often that the keel experiences the bad effect of a strain. It is, therefore, very important to inquire into the true cause of the accident.

"For this purpose, let us conceive the vessel divided into two parts, by a transverse section through the vertical axis of the vessel, in which both the centre of gravity, *G*, of the whole vessel, and that of the immersed part *O*, are situated; so that one of them will represent the head part, and the other that of the stern; each of which we shall consider separately. Let *g* be, therefore, the centre of gravity of the entire weight of the first, and *o* that of the immersed part corresponding. In the same manner, let *y* be the centre of

gravity of the whole stern part, and *w* that of its immediate portion.

"Now it is plain that the head will be acted upon by the two forces *gm* and *on*, of which the first will press it down, and the latter push it up. In the same manner, the stern will be pressed down by the force *yu*, and pushed up by the force *wx*: but these four forces will maintain themselves in equilibrium, as well as the total forces reunited in the points *G* and *O*, which are equivalent to them; but whilst neither the forces before nor those abaft fall in the same direction, the vessel will evidently sustain efforts tending to bend the keel upwards" (called *hogging*) "if the two points *o*, *w*, are nearer the middle than the two other forces *gm* and *yu*. A contrary effect would happen if the points *o* and *w* were more distant from the middle than from the points *g* and *y*," called *sagging*.

"But the first of these two cases usually takes place in almost all vessels; since their hollow has a greater breadth towards the middle, and becomes more and more narrow towards the extremities; whilst the weight of the vessel is, in proportion, much more considerable towards the extremities than at the middle. From whence we see, that the greater this difference becomes, the more also will the vessel be subject to the forces which tend to bend its keel upwards: it is, therefore, from thence that we must judge how much strength it is necessary to give to this part of the vessel, in order to avoid such a consequence.

"If other circumstances would permit, either to load the vessel more in the middle, or to give to the part immersed a greater hollow towards the head and stern, such an effect would no longer be feared: but the destination of most vessels is entirely opposite to such an arrangement; by which means we are obliged to strengthen the keel as much as may be necessary, in order to avoid such a disaster."

Having now investigated the centre of gravity of the displacement, meta-centre, and centre of gravity of the whole ship, with other particulars, and laid down all that is requisite to be attended to, in that respect, for the construction of a ship's body under water, we shall, in the next section, proceed to complete the remainder of the sheer-draught.

To complete the Construction of the Sheer-draught. Plate I.

Having found that the displacement of the ship at the load-water-line gives the ship sufficient stability to keep the lower ports 5 feet 10 inches above the water, we may proceed to draw all the decks in the sheer-plan, beginning with the lower, or gun-deck. The height of the lower fills of the gun-deck ports should be 2 feet 4 inches above the gun-deck plank, which is four inches thick; consequently the upper side of the beam along the side must be 2 feet 8 inches below the fills; add six inches to that for the round-up of the beam; and the under side of the gun-deck at the middle line in midships will be 22 feet 2 inches above the upper edge of the keel; at the foremost-perpendicular set up 24 feet, and at the after-perpendicular 24 feet 8 inches; then a segment of a circle drawn through these three heights will represent the under side of the gun-deck at the middle line. (These kinds of sweeps are drawn by thin veneers of pear-tree wood, called sweep-moulds, struck from a long radius on purpose, or by a drawing-bow.) Now set up four inches, the thickness of the gun-deck plank, above the line last drawn, and let another line be drawn parallel thereto, and the gun-deck will be described at the middle line in the sheer-plan.

Next proceed to draw the upper deck; set up 7 feet 2 inches, being the height from the upper side of the gun-deck plank to the under side of the upper deck plank, along the

SHIP-BUILDING.

the middle line, through which heights draw a curve parallel to the gun-deck, and another curve three inches parallel above it, and the upper deck will be represented at the middle line of the sheer-plan.

The stern-timbers should be next drawn, to shew the boundaries of the sheer-plan above the wing-transom. Set up above an horizontal line drawn at the upper side of the wing-transom at the middle line four feet, upon a perpendicular 6 feet 10 inches abaft the aft-side of the wing-transom, which will be the height and knuckle of the lower counter at the middle line; from thence draw a curve, about six inches hollow, to the upper side of the wing-transom, where the fore part of the rabbet of the stern-post intersects it; and that curve will represent the lower counter at the middle line.

In the same manner, set up the height of the upper counter 7 feet 5 inches, upon a perpendicular nine feet abaft the aft-side of the wing-transom, which will be the height and knuckle of the upper counter at the middle line; then drawing a curve about one inch hollow from thence to the knuckle of the lower counter, the upper counter will likewise be described at the middle line.

Having the upper and lower counters drawn at the middle line, the upper part of the stern-timber is straight above the upper counter, and must be drawn as follows:

Set up 23 feet 8 inches, upon a perpendicular 14 feet abaft the aft-side of the wing-transom, as before, and then drawing a straight line from the knuckle of the upper counter, to pass through the said spot, the upper part of the stern-timber will be shewn at the middle line, by which the rake of the stern will be described.

As the stern rounds two ways, both up and aft, (or forward from the timber already drawn,) the stern-timber at the side must alter so much from that at the middle line, and therefore remains to be represented. Set down from the knuckle of the upper counter on its perpendicular 9 inches, and draw an horizontal line before it at that place, and set off thereon 15 inches from the said perpendicular, which will be the knuckle of the upper counter at the side the 9 inches is the round-up, and the 16 inches the round-aft at the upper counter. Then proceed in like manner for the lower counter, by setting down 9 inches, and forward 15 inches, and the knuckle for the lower counter at the side will be produced; then, by drawing a curve from the knuckles at the side (similar to the curve or hollow at the middle line), observing the lower counter at the side is drawn to intersect the touch of the wing-transom at the side, the side stern-timber only wants the upper part to complete it. But as the straight line, which remains to be drawn for the upper part of the side-timber, should not be parallel to that at the middle line, the following method will determine the exact rake thereof.

Draw a straight line at pleasure, as the ticked line under the body-plan, on which set off the breadth of the stern at the upper counter, or 13 feet 4 inches, equally on each side of the middle line; and there square up a perpendicular on each side: set up from the straight line 16 inches, the round-aft of the upper counter on each perpendicular, and draw a segment of a circle that shall intersect those spots and the straight line at the middle, and the round-aft of the stern will be described at any part of the breadth above the upper counter: thus, take the breadth of the stem at the top timber-line, which is 24 feet 8 inches above the wing-transom, which is 24 feet, and set it off equally on each side the middle, to where it shall intersect the round-aft under the body-plan; thence draw a line parallel to that first drawn, and the distance between the two lines, $13\frac{1}{2}$ inches, is the

distance that the side-timber will be from the middle-timber: on an horizontal line, at the height of the top timber-line, draw a straight line through the last spot set off to intersect the knuckle of the upper counter at the side, and that will be the rake of the side counter-timber, as shewn by the ticked lines in the sheer-plan, *Plate I.*

The rake of the stern-timbers being determined, proceed to finish the decks. Set up from the upper side of the upper deck 6 feet 10 inches at the middle stern-timber, and 6 feet 8 inches fore part at frame 8, and above that 3 inches, drawing curves as before, and the quarter-deck at the middle line will be represented.

Proceed in the same manner with the round-house abaft. Set up from the upper side of the quarter-deck 6 feet 8 inches at the middle stern-timber, and 6 feet 6 inches at fore part or frame 24, and above that $2\frac{1}{2}$ inches. The forecastle forward is represented in the same way, by drawing curves, one parallel to the upper side of the upper deck 6 feet 7 inches above it, and another at 3 inches from the beak-head to frame D.

All the decks having been drawn, representing their heights at the middle line, their heights at the sides differ from the former, agreeable to the round of the beam in the breadth of the ship: to do which correctly, take the round-up of the beam of its respective deck, say the gun-deck, 6 inches, and set it up in the middle of any straight line, so that the half-breadth in midships at the height of the gun-deck may be set off on each side on the line. Then raise the segment of a circle that shall intersect the round-up at the middle, with the spots at the breadth, and the round-up of the deck will be described at any part of its breadth. Thus, take the half-breadth at the height of the deck at any timber in the body-plan, and set it off equally from the middle of the round-up till it intersects the curve; whence draw a line parallel to that first drawn, and the distance between the last line to the round-up in the middle is what the beam rounds at that place: thus may the round-up be taken at as many timbers as may be found necessary, and set below the under side of the deck, at its respective timber in the sheer-plan; then a curved line passing through those spots, will represent the deck at the side: but observe, that the decks are to have a sufficient round abaft, to correspond with the round-up of the stern above the lights, and that the additional round wanted to be set down at the side line.

The sheer or top timber-line may be next drawn, by setting up its height in the sheer-plan afore in midships, and abaft: thus, at timber X forwards, 37 feet 8 inches; at \oplus in midships, 35 feet 4 inches; and at the side stern-timber abaft, 41 feet 6 inches: then, by drawing a curve through these spots, as in *Plate I.* the sheer of the ship, or top-timber line, will be represented.

The ports may now be drawn in the sheer-plan, thus: draw two curves in pencil parallel to the deck at the side, fore and aft, adding the thickness of the deck to that already drawn, as that represents the under side of the deck, or upper side of the beam. The gun-deck ports are to be 2 feet 4 inches from the upper side of the gun-deck plank to the upper side of the lower fills, 2 feet 8 inches deep, and 3 feet 5 inches fore and aft, or from the fore to the after sides, which may now be squared up between the lines last drawn; placing the fore-side of the foremost port 1 foot 5 inches abaft timber X, and 3 feet 1 inch only on athwartship line; the aft-side of the after-port to be 14 inches afore timber 32, and the fore-side 3 feet 5 inches afore it, or in the clear; and the remaining 13 to be 7 feet 7 inches asunder. In the same manner draw in the upper deck ports, which

SHIP-BUILDING.

which are from the plank to the port-fill 1 foot 11 inches, 2 feet 8 inches deep, and fore and aft 3 feet; and are to be placed equally between and over the gun-deck ports, as circumstances will admit, as shewn in the sheer-plan, *Plate I.* The ports on the quarter-deck, round-house, and fore-castle, must be placed hereafter where there is a vacancy between the dead-eyes to admit of them, observing to place them as nearly as possible at equal distances.

To know the heights, round-up, &c. &c. of the other decks, take them with compasses, in like manner as the gun-deck was set off from the given dimensions; and by applying them to the scale of feet, much repetition will be avoided.

The round-house deck being drawn, draw a line parallel to the top timber-line, and another line three inches above it, which is of the thickness of the plank-sheer, corresponding with the fore part of the round-house, so as to make both plank-sheer and water-way; so will the extreme height of the top-side be described abaft: the plank-sheer, which completes the height of the side to the fore part of the quarter-deck, is four feet four inches to the under side above the top timber-line, and parallel thereto. The fore part abreast the main-mast hances down eleven inches for seven feet abaft the gangway or fore part of the quarter-deck.

The drift-rail may now be drawn, the under side of which is two feet ten inches above the top timber-line, and parallel thereto from the hance of the plank-sheer at the main-mast to the quarter-gallery. The drift-rail is four and a half inches deep, and drawn parallel to the under side last drawn, and hances as the plank-sheer abreast the main-mast, and stops with a scroll upon the sheer-rail at the gangway. The sheer-rail may next be drawn: it is six inches deep, and parallel to the top timber-line from the cat-head to the quarter-gallery. The plank-sheer and sheer-rail at the fore part of the ship delineate the height of the top-side there: the under side of the plank-sheer is two feet nine inches above the top timber-line, and the under side of the drift-rail one foot eight inches, and turns off with scrolls at the after part of the fore-castle, but in other respects the same as those at the quarter-deck.

It is the practice in the navy of late years, to have square drifts instead of scrolls or hances of any kind.

The upper part of the ship being thus far complete, we have at one view the utmost extent of the sheer, as seen on a plane.

It now remains to be drawn in the finishing parts, as the wales, stern, head, rails, &c.

Proceed to represent the main wales by setting up their lower edge, at the rabbet of the stem or fore part, above the upper edge of the keel 22 feet 6 inches, in midship or dead-flat 18 feet 8 inches, and at timber 34, 23 feet, and draw the curve as in sheer-plan, *Plate I.* Above that, and parallel thereto, draw another curve at 4 feet 4 inches, the breadth of the main wales.

Next draw in the channel wales, set up as before, at the rabbet of the stem 30 feet 2 inches, in midships 27 feet 3 inches, and at timber 34, 31 feet 6 inches. Set up their breadth 3 feet, and draw curves as in sheer-plan, *Plate I.*

The waist-rail may be next drawn: its distance below the top timber-line is one foot ten inches, the upper side and its depth six inches, and it is drawn parallel to the top-timber line all fore and aft.

Now, before the channels and dead-eyes can be drawn, the centres and raking of the masts must be determined; their centres on the gun-deck being fixed upon in proportion to the length of the gun-deck, thus: the centre of the fore-mast is 21 feet 4 inches abaft the aft-side of the stem, or half its diameter before the one-ninth of the length on the

gun-deck: the centre of the main-mast 101 feet 4 inches abaft the aft-side of the stem, or half its diameter abaft the five-ninths of the length of the gun-deck: and the centre of the mizen-mast 27 feet before the rabbet of the stern-post, or half its diameter before the one-seventh of the length of the gun-deck. The centre being fixed, the fore-mast rakes aft (or inclines from a perpendicular with the keel) one-eighth of an inch in every yard of its length; the main-mast rakes aft one inch in every yard in the length; and the mizen-mast one inch and a half in every yard of its length, as drawn in the sheer-plan, *Plate I.*

Now draw the channels, placing their upper edges next the side in a line with the upper edge of the sheer-rail; or, which is much better, since the rails on the side are discontinued, rather lower down, clear of the seam. The fore channel to be 36 feet long, and so placed as to take the anchor-lining and bill-board for stowing the anchor at its fore end, thus: get the length of the anchor to the bill, or extent of the arm, and allow for the cat-block; then with that distance sweep upwards from the channel-wale to the channel, from the outer end of the cat-head nearly, and the curve that the bill of the anchor is supposed to make, will give the middle of the lining: the aft-side from the channel may be perpendicular, and the fore part follow the curve made by the anchor. The bill-board may then be carried upwards from the upper side of the channel to the top of the side. The anchor-lining commences at the upper side of the bolster, which rests on the channel-wale, and is long enough at the fore part for a man to stand upon.

The main channel is 29 feet 6 inches long, placed in the same range as the fore channel, and its fore-end before the centre of the mast about six inches.

The mizen channel is 16 feet 4 inches long, placed like the former, but is more convenient when placed, as it now is, above the quarter-deck ports.

The dead-eyes may now be drawn, observing to place them in such a manner that the chains may be sufficiently clear of the ports. All the preventer-plates must be so placed on the channel-wales, and of such a length, that the centre of the chain-bolt may come about six inches below the upper edge, and the preventer-bolt about four inches above the lower edge of the channel-wales. The dead-eyes in the main and fore channels are sixteen inches in diameter, and eleven in number in the fore and twelve in the main, though lately another is added in each. In the mizen are seven, of eleven inches diameter; the centre of the foremost dead-eye is placed at or just abaft the centre of the mast, and the centres of the others are spaced so as to clear each other about three inches, which will admit of four dead-eyes between each port. It must also be observed to give each of the chain and preventer-plates a proper rake; that is, to let them range in the direction of the shrouds; which may be done in the following manner: draw a pencil line upwards at the centre of each mast, upon which set off its length to the lower part of the head; then, by drawing straight lines from that height, through the centre of each dead-eye, the direction of each chain will be obtained by the direction of its corresponding line. The dead-eyes for the backstays are so similar to the former, that it need only be observed, that for the raking of them, the height of the top-mast to its head must be added to the lower mast, and that they are fixed at the after-end of the channel, or on stools, if need be, above the channels, as in sheer-plan, *Plate I.*

The quarter-deck and fore-castle ports can now be determined, as they must be placed clear of the shrouds, and equally afunder, or nearly so, as circumstances will admit; thus, there are three on each side on the fore-castle, made

SHIP-BUILDING.

by the timber-heads there shewn, having also a timber-head between. But the practice now is to have a rail upon the heads of the timbers, and the sides birthed up on each side to the under side of the rail between the ports, and only three or four timber-heads run up, one in particular before the bill-board for the shank-painter. On the quarter-deck are seven ports of a side, and four on the round-house, placed as clear as possible of the shrouds, as shewn in sheer-plan, *Plate I.*

The chest-tree for hauling home the main-tack must be placed near the after-end of the fore channel, or half the length of the main-yard before the centre of the main-mast, and drawn from the top of the side down to the upper edge of the channel-wale.

The steps on the side may next be drawn: they must be placed at the fore part of the main drift or gangway, about three feet in length, six inches afunder in the clear, and five inches deep: the upper step to be eleven inches from the top of the side, continuing the others to the upper edge of the wale.

To complete the sheer-plan, the head and stern only remain to be drawn, which are as useful as ornamental. Therefore we will proceed with the head, thus: draw the beak-head or its boundary aft, by raising a perpendicular six feet abaft the aft-side of the stem, at one foot eleven inches above the deck at the side, or draw an horizontal line at the same height as the upper deck port-fills: the horizontal is the flat of the beak-head, and the perpendicular continued up to the rail above the forecattle, represents the fore part of the beak-head, and will likewise determine the foremost end of the forecattle. Since *Plate I.* has been engraved, the beak-head in the navy seems to be done away, and the bow continued to the top of the side, as in the East India ship, *Plate XII.* It may be stronger thus, but the beak-head was very useful. Let 15 feet 6 inches, the length of the head, be set off from the fore part of the stem, and there draw a perpendicular which will determine the fore part of the block or figure; draw another perpendicular at 3 feet 10 inches abaft the former, which is the moulded breadth of the figure, and boundary of the hair-bracket at the upper part. Before the height of the figure can be ascertained, the bowsprit must be drawn, thus: set up 4 feet 6 inches at the aft-side of the stem, above the upper deck, for its middle line, and five or raise that line 5 inches or $5\frac{1}{4}$ inches above an horizontal in every foot forward; then set off 1 foot $5\frac{1}{2}$ inches above and below this middle line, and draw lines parallel thereto, and the bowsprit will be represented in the sheer-plan, *Plate I.* Now the upper part of the block for the figure can be determined, as that should be at least six inches clear of the under side of the bowsprit, which should pass the under side of the foremost upper deck beam, and step in the partners on the gun-deck a convenient height for the after part of the manger, as in the inboard works, *Plate IV.* of *Ship building.*

The cheeks are next to be drawn: set up the height of the lower cheek at the stem, which is 25 feet at its under side, above the rabbet of the keel, and draw the after-end to the sheer, and the fore part with a handsome flight, so as to break in with the perpendicular at the fore part of the figure; then set up from the under side of the lower cheek, 3 feet 5 inches at the stem for the under side of the upper cheek; draw the after-end rather more than the sheer, and the fore part with more flight than the lower cheek, so as to make a handsome curve line with the fore part of the hair-bracket. From the under side of the lower cheek, set up at the fore part of the stem 7 feet 11 inches, which is the upper side of the upper rail, and draw the bag of it, or the part

immediately before the stem, nearly horizontal, or to the sheer of the flat of the beak-head, it agreeing to that height. The fore-end should curve upwards, so as to appear parallel with the upper cheek, or nearly so; and to form the after-end, draw a curve from the bag to break in fair with the beak-head line.

Now the moulding of the upper rail and siding of the cheeks may be drawn, and as they taper all their length regularly, set off 1 foot above the lower side at the after-end of the cheeks, which is 5 feet abaft the fore-side of the stem on the sheer, and 7 inches at the fore-end, or about 8 feet 6 inches before the stem. Then the moulding of the upper head-rail, which is 1 foot, must be set off abaft the beak-head line, or fore-side of the rail, and drawn parallel thereto from about 5 feet below its head, (which must range with the under side of the rail above the forecattle, or six inches higher than the range of the other timber-heads,) and from thence to taper to six inches at the fore-end, which comes to the hair-bracket, which is a continuation of the upper cheek, and runs in a handsome serpentine line up the back of the figure, as high as where the shoulder of the figure is supposed to come; at which place it terminates with a scroll. The upper part of the figure or block is formed, by continuing the line from the breast or fore part of the figure to the top of the hair-bracket, observing to keep the upper part six inches clear of the under side of the bowsprit, as before observed.

The head-timbers may now be drawn, placing the stem-timber its thickness, which is 7 inches, before the stem, and to stand perpendicular from the upper side of the lower cheek to the under side of the upper rail. The foremost timber to be 8 feet before the stem, and to stand parallel to the stem-timber, or rake half its thickness at least, which is $2\frac{1}{2}$ inches, which will produce a lighter appearance in the head: the middle timber is placed equally between the two former, and is six inches thick. Another timber is sometimes placed abaft the stem-timber, at the same distance as the one before it, the heel of it stepping on the upper edge of the lower rail. The length of the block for the figure sometimes terminates by a perpendicular line at the heel of the foremost head-timber; the lower cheek ends there, or is continued higher up the figure, and finishes with a scroll. The hair-bracket also continues down to the heel of the figure.

The head-timbers being drawn, the middle and lower rails may be drawn by dividing the space between the upper side of the upper cheek and under side of the upper rail equally at every head-timber; then drawing curves to pass through the moulding depth of each rail, equally set off from the above spaces, which moulding depth is $6\frac{1}{2}$ inches at the stem, and $4\frac{1}{2}$ inches at the hair-bracket. The after-end of the lower rail may terminate where it touches the side. Before the rail above it can be finished, the cat-head must be drawn, letting it project from the aft-side of the upper part of the main or upper rail to rake forward, so as to stand square with the bow, or nearly so, and to rise upwards $5\frac{1}{2}$ inches in every foot of its length, which is 8 feet 6 inches without the bow; observing that the under side is to lay on the plank of the forecattle at the side: the upper side may be drawn parallel to the under side at 1 foot $4\frac{1}{2}$ inches, its depth: the knee or supporter under the cat-head forms a fair curve to the after-end of the upper middle rail, as in sheer-draught, *Plate I.* The knee or supporter under the cat-head lately hangs perpendicularly, or nearly so, and the rail ends against the side.

The knee of the head may next be drawn; it is to project from the breast of the figure about four inches; thence draw

draw the fore part of the knee, with an agreeable serpentine line to its breadth from the stem, which should not exceed two feet on a square at the load-water-line; then, by continuing the same line downwards, narrowing more and more till it approaches the gripe, and drawing it more distant from the stem, to about four feet in the broadest place, let the lower part break in fair with the under side of the false keel, where it terminates with the fore foot or fore part of the keel, which will be next described. The gammoning-holes come between the head-timbers, and the bobstay-holes at the fore part of the knee, and the hawse-holes between the cheeks are to be 2 feet 6 inches up from the deck, and 1 foot 3 inches in diameter, as shewn in the sheer-plan, *Plate I.* See *Hawse-holes*, hereafter described. From the line representing the upper edge of the keel, set down 1 foot 6 inches, its depth, and draw a line parallel to its upper edge the whole length, which is 1 foot 2 inches before timber S, to the aft-side of the stern-post, and the lower edge of the keel will be represented; but to complete the fore foot, which must be of a sufficient depth to receive the lower part of the stem, called the boxing, square up the fore end of the keel from the under side to the fore-side of the stem, and from thence square it to the aft-side of the stem from its curve. The boxing, or lower part of the stem, may now be drawn: set aft from the line last squared 6 feet 6 inches, and draw a perpendicular to half the depth of the keel, and from thence continue a line forward, parallel to the lower edge of the keel, one-third the length of the scarf, which will meet the fore-side of the stem and complete it.

The false keel, which is six inches deep, may be drawn by a line parallel to the under edge of the main-keel; the fore end of it may continue about three inches before the main-keel, or run through to the fore part of the gripe.

The sheer-draught being thus far completed forward, the stern and quarters may be finished; and first draw a line which shall represent the aft-side of the quarter-piece, agreeable to the round-forward of the stern, which is 13 inches before the side stern-timber, on a square, and nearly parallel thereto, continuing this line from the plank-sheer to the lower gallery rim, the upper side of which is, at the line last drawn, 6 feet 5 inches above an horizontal line, at the upper side of the wing-transom at the middle. (Observe, all the heights of the stern will be set up above this line, for the manner of obtaining which, with every particular relative to the stern, the reader is referred to the section *Laying-off the Stern*, and *Plate X.*) At the height last set off, draw the upper side of the rim forward parallel to the sheer or top timber-line to 16 feet 6 inches, its length; then draw another line parallel under it at 10½ inches, its depth. The height of the upper side of the rail at the middle stool is 11 feet 9 inches at the quarter-piece, which must also be drawn forward parallel to the sheer to 16 feet 8 inches, its length; its depth, which is 9½ inches, draw in as the middle rim. The fore part of the quarter-piece may next be drawn, as the heel of it steps on the after end of the middle stool, by drawing a line parallel to the aft-side at 14 inches, its siding. Draw the middle rim-rail, as before directed, at 15 feet 3 inches, the height of the upper side at the fore-side of the quarter-piece, to 12 feet 2 inches, its length. In the same manner draw the upper stool-rail, its upper side being 19 feet 5 inches up at the quarter-piece, and its length forward 12 feet 8 inches. Above this rail is the upper finishing, the upper rail of which ranges with the height of the plank-sheer, with another rail below it at 9 inches in the clear: the upper rail may be about 3½ inches, and the other 4 inches. The upper rail of the finishing is 2 feet 8 inches short of

the upper stool-rail, and finishes at the fore part, as in the sheer-draught, *Plate I.* The boundary, or fore part of the upper gallery, is 11 feet 7 inches on the run of the middle rim; from thence a line is drawn upwards, parallel to the quarter-piece. Between the middle stool-rail and the rim above it, the fore part is completed by a curve. The length or boundary of the lower gallery is 15 feet 6 inches on the lower rim; from thence a line is drawn upwards, parallel to the rake of the side stern-timber. Now the lights and munions, which are three in each gallery, may be equally spaced; the lights in the lower gallery to be 2 feet 9 inches in the clear on a square, and the munions about 11 inches each; the lights in the upper gallery 2 feet 4 inches in the clear on a square, and the munions about 9½ inches each; observing to keep their lower sides up from the rail, about 5 inches the lower ones and 4 inches the upper ones for the water-table, and their upper sides about 4 inches clear of the under sides of the stool-rails above. Draw the lower stool-rail along the quarter, which is a continuation of the lower counter-rail, as the middle rim is of the upper counter-rail, at the outside of the quarter-piece, from whence they are to be continued their length parallel to the sheer, and that will be the height of those rails, as viewed on a level. The height of the lower counter-rail, at the side abaft, is 3 feet 4 inches, and from thence continued parallel to the rim-rail above: to its length, which is 13 feet, set down 10½ inches, its depth, and draw it parallel to the upper side.

The lower finishing is 2 feet 3 inches deep below the lower stool, and its boundary formed by curves, so as to have a light airy appearance, with a stool nearly in the middle of its depth.

The foot-space rail may be 9½ inches deep, and rabbets on the ends of the flat of the quarter-deck. The breast-rail is 9½ inches deep, and its upper side is 3 feet 2 inches above and parallel to the other, both projecting 2 feet 6 inches on a square to the aft-side at the middle line from the midship stern-timber. But to complete the balcony, quarter-piece, and taffrail, as shewn in the sheer-plan, the reader is again referred to laying-off the stern, and *Plate X.*

The birthing of the lower counter may be represented by drawing a curve 4 inches parallel abaft the aft-side of the counter-timbers, from the knuckle to the tuck-rail, which covers the margin on the wing-transom, and projects its thickness 9½ inches. Draw likewise the birthing of the upper counter, which is 2½ inches thick, and parallel to the stern-timbers. Above the upper counter-rail draw in the thickness of the middle munion, which is 3 inches, and parallel to the middle stern-timber, and continued upwards to the arch-board over the lights, which is about 4½ inches deep.

The rudder may now be represented in the sheer-plan, observing, that the head is continued above the upper deck, high enough to receive a tiller about four inches above the deck; then allow for two hoops above the hole, making the upper part of the head 2 feet 6 inches above the deck. Continue upwards the aft-side of the stern-post, which represents the fore-side of the rudder, from whence its breadth or aft-side is set off; and as this should not be more nor less than sufficient to direct the course of the vessel, the common practice is to make the breadth at the heel, or lower end, one-eighth of the main breadth, which will be six feet for ships having a clean run abaft; but for merchant-ships, or those constructed chiefly for burthen, it may be one-seventh. The height of the lower hance may be fixed at the load-water-line, or about six inches above it, and its breadth there should be five-sevenths of the breadth at the

SHIP-BUILDING.

heel, back included; set forward from thence 10 inches, or reduce the breadth to 3 feet 5 inches. The upper hance may be at one-third the height of the lower hance, and the breadth of the rudder there should be five-sevenths of the breadth at the lower hance, or 3 feet 1 inch; there reduce the breadth 5 inches, which makes it 2 feet 8 inches, from whence a straight line may be continued to the head, which is 2 feet 4 inches fore and aft, or larger, if the piece will admit of it: each hance should be reduced with mouldings, as in sheer-draught, *Plate I.*, and $3\frac{1}{2}$ inches drawn parallel to the aft-side, to represent the thickness of the back. The heel of the rudder, at the fore part, should be 9 inches short of the under side of the false keel, and 11 inches at the aft-part, the sole included, which is 6 inches deep.

The pintles and braces may be now represented, placing the upper brace about four inches above the wing-transom, that the straps may clasp round the standard on the gun-deck. The second brace should be so placed as to fasten on the middle of the gun-deck transom. The lower brace may be placed 15 inches above the upper side of the keel, and the intermediate ones, four in number, to be equally placed between the two latter, making seven in all. The length of the braces may be governed by a straight line drawn from the third brace, which should be 4 feet 6 inches afore the rabbet of the post to the lower one, which is to be six feet.

The length of all the straps of the pintles, which come upon the rudder immediately above the braces (except the thickness of the bur or saucers), may extend within four inches of the aft-side: the pintles are $3\frac{1}{2}$ inches in diameter, and all 14 inches long, except the lower one, which is 2 inches longer. The straps of the braces and pintles are five inches broad.

The length and breadth of the rudder being represented in the sheer-plan, *Plate I.*, it is evident the breaks or hances are merely to reduce the breadth as it rises towards the head, the greatest breadth being only required below the water, where it feels the motion of the ship.

The fluid, in passing to the rudder, exactly follows the outlines of the bottom; and supposing the rudder to make an angle of 45 degrees with the keel, it may be readily seen, by the water-lines abaft in the half-breadth plan, that the immediate shock it receives from the water increases as it approaches to the load-water-line, where they become nearly at right angles with the side of the rudder in that position, and this holds good, whatever angle the rudder makes with the keel; hence some are of opinion, that the rudder should be made broader near the line of floatation, and narrower towards the keel; but the present method of making the rudder with increasing breadth downwards, is only in proportion to the obliquity of impulse the water acts against it near the keel. It must be observed, that the above force strikes the rudder obliquely, and only strikes it with that part of its motion which, according to the sine of incidence, forces it in a contrary direction, with a momentum which not only depends on the velocity of the ship's course, by which this current of water is produced, but also upon the extent of the sine of incidence. This force is by consequence composed of the square of the velocity with which the ship advances, and the square of the sine of incidence, which will necessarily be greater or smaller according to circumstances; so that if the vessel increases her velocity three or four times faster, the absolute shock of the water upon the rudder will be nine or sixteen times stronger, under the same incidence; and if the incidence is increased, it will yet be augmented in a greater proportion, because the square of the sine of incidence is more enlarged.

Amongst the several angles that the rudder makes with the keel, there is always one position more favourable than any of the others, as it more readily produces the desired effect of turning the ship, in order to change her course.

If the angle of the rudder with the keel is greater than 45 degrees, the action of the water upon the rudder will increase, and at the same time oppose the course of the ship in a greater degree; because the angle of incidence will be more open, so as to present a greater surface to the shock of the water, by opposing its passage more perpendicularly.

If, on the contrary, the angle is lessened to 30 degrees, the rudder will receive the impression of the water too obliquely, for the angle of incidence will be more acute, so that it will only present a small portion of its breadth to the shock of the water, and by consequence will only receive a feeble effort. Thus it appears, that between the effects which result from the water's absolute effort, there is one which always opposes the ship's course, and contributes less to her motion of turning, whilst the other produces only this movement of rotation, without operating to retard her velocity. Hence we may conclude, that when the water either strikes the rudder too directly, or too obliquely, it loses a great deal of the effect it ought to produce. Between the two extremes there is, therefore, a mean position, which is the most favourable to its operation, *viz.* the angle 45, or between that and 42 degrees. See Watson's Euler, p. 130. See also RUDDER.

It is evident, that the fore part of the rudder, as high up as the head of the post, must be trimmed on each side, to the middle of its thickness, (which is the same thickness as the aft-side of the stern-post, or rather less, as it need not project the post when the helm is hard over,) to the greatest angle the rudder is proposed to make with the keel: however, the common method is to set off two-fifths the thickness of the rudder from the fore part on each side, and from thence trim it straight through to the middle of its thickness, or, what is better, to leave the middle to the convexity of the pintles, rather than a sharp edge. By this method the rudder may be put over to the angle of 50 degrees, which is more than is necessary, and it is very seldom that the tiller, owing to its length, can be put over so far to the side as to allow of the rudder making an angle of more than 45 degrees, which angle is quite sufficient.

When the above angle, or what is technically called the *bearding*, is wholly taken from the fore part of the rudder, the main piece is very much wounded by letting on the upper pintle; but this of late years has been greatly remedied, by taking half the bearding from the aft-side of the stern-post at the head, and from one to two inches on the heel; of course the rudder is bearded so much the less. This, also, will greatly assist the conversion of the stern-post.

The bearding on the rudder is represented by the shading on the fore part of the rudder, and the bearding on the post by the ticked line in sheer-plan, *Plate I.*

The rudder, which is represented in the sheer-draught, *Plate I.*, and is as at present used in the navy, having its axis of rotation in the centre of its pintles, which are parallel to the aft-side of the stern-post, causes a space, considerably greater than its transverse section, to be cut in the counter for the rudder to revolve in, which would be impervious to the waves, were it not defended by a coating of tarred canvas, nailed in such a manner to the rudder and counter, as to cover the whole space required. But the ill effects of having so large a space so ill guarded, have proved very dangerous.

It was to remedy this defect that *round-headed* rudders of late years have been adopted in many merchant-ships, particularly

particularly those in the service of the East India Company.

The round-headed rudder is represented in the sheer-plan of the East India ship, *Plate XII.*, which consists in making the upper part of the rudder above, and some inches below the hole in the counter, cylindrical, and giving that part, at the same time, a cast forward above the upper brace, so that the axis of rotation may by that means be the line passing, as usual, from the heel of the rudder to the upper brace, or that next below the counter, and from thence upwards through the axis of the cylindrical part, or head, in order that the transverse section at the counter may be a circle revolving upon its centre: in which case the space of half an inch is more than sufficient between the rudder and the counter, and consequently the necessity of a rudder-coat entirely done away. But as it was foreseen, that if the rudder was by any accident unshipped, this alteration might endanger the tearing away of the counter, the hole is made from two to four inches larger all round, according to the size of the ship, than the transverse section of the cylindric part of the rudder, but that space is easily covered over with a wooden rim, about two inches thick, and of sufficient breadth to nail to the counter clear of the hole: this rim is fitted nearly close to the rudder, and is capable of resisting the shock of the sea, but easily carried away with the rudder, leaving the counter, under such circumstances, in as safe a state as it would be, agreeable to the present form of making rudders in the navy.

It is easy to conceive that the braces cannot be carried up so high on the stern-post with a round-headed rudder, as in *Plate I.* But then the head is better steadied, as it has a large bolt driven down through the centre, that traverses in a thick brass plate confined in a strong oaken frame, fixed over the head.

It may also be readily seen, that to bring the axis of rotation through the centre of the rudder-head, it must cast so much forward, as was before observed, which requires a sudden hance between the upper brace and the counter; but to avoid this hance cutting away the main post too much at the head, a false post, sufficiently thick, is tabled or coaked to the aft-side of the main post, as in *Plate XII.*

The body and half-breadth plans may now be completed, as it remains to add the supernatant part, or top-side.

Transfer the heights of the top timber-line from the sheer-plan, *Plate I.* to the body-plan, and draw an horizontal line, at each height, across each respective body. Now the breadth of the ship at this height determines the tumbling-home of the top-side, which should not be too much, as formerly, as it creates an unnecessary consumption of crooked or compass-timber, or an extravagant waste of large timber, which must be much weakened by being cut across the grain. Again, great advantages would be derived from having little or no tumbling-home to the sides, as it gives more room upon deck, a greater spread to the shrouds, additional security to the masts, makes the ship stiffer, a much better sea-boat, and in every respect safer, stronger, and better. On the contrary, it may be argued, that by the top-side tumbling-home, particularly in ships of war, all the weight of guns, &c. lying above the load-water-line, may thereby be brought nearer to the middle line, when of course the ship will be less strained by the working of her guns also; but others have endeavoured to prove, that by the weights being equal on both sides, they counterpoise each other, and do not strain the ship, whatever distance they may be removed from the middle line. Again, the top-side narrowing or tumbling-home, as it approaches the top of the side, particularly in

ships having two or three gun-decks, the smoke of the lower guns in action less annoys those on the decks above.

In *Plate I.* the top-timber breadth in midship is four feet less than the main breadth, consequently the top-side tumbles home two feet on each side, and may be so continued in the half-breadth plan parallel to the main breadth, from frame 22 abaft to H forward; then from the middle line at K set up 21 feet 11 inches; at M, 21 feet 8 inches; at O, 21 feet 6 inches; at Q, 21 feet; at S, 20 feet 4 inches; at U, 19 feet; and at the beak-head, 17 feet: at 24, in the after body, 20 feet 7 inches; at 26, 20 feet; at 28, 19 feet 6 inches; at 30, 18 feet 9 inches; at 32, 18 feet; at 34, 17 feet 2 inches; at 36, 16 feet; then to end it abaft, square down to the half-breadth plan the intersection of the top timber-line at the side counter-timber in the sheer-plan, and set up, as before, 12 feet. Then a fair curve-line drawn through these spots, represents the top-timber half-breadth.

Transfer the top-timber half-breadths from the half-breadth plan to their corresponding horizontal lines at the top timber-line from the middle line in the body-plan. Now the timbers may be formed above the lower height of breadth in the body-plan, thus; transfer the upper height of breadth-line from the sheer-plan to the body-plan, drawing thereat horizontal lines; then square up the timbers already drawn to intersect the upper height of breadth respectively; open the compasses to 15 feet, the length of the upper-breadth sweeps, and fix one foot on each line last drawn; then from the lines, as squared up, describe an arc of a circle upwards at each timber; then draw at \oplus a curve to the hollow of the top-side, touching the back of the upper-breadth sweep, and the breadth at the top timber-line, thus; the timber at the top-side is formed in midships, to which let a mould be made from the upper height of breadth upwards, continuing the same hollow of top-side some feet above the top timber-line at \oplus , by which mould all the timbers of the top-side, except two or three quite aft and forward, may be drawn, and both bodies completed to the top of the side, by moving the mould at each timber gradually upwards, so as to make a fair line with the upper breadth sweep, touching the breadth at the top timber-line.

The foremost frames, as X, U, and S, towards the top of the side, curve outwards, or the contrary way to those abaft them; because the breadth at the top timber-line projects the main breadth below, by which the anchor is hove up clear of the bow. From their breadth at the top timber-line, square up a perpendicular line to the top of the side, which produces a sudden angle or knuckle at the top timber-line, from whence they are called *knuckle-timbers*.

From the sheer-plan transfer the heights of the top-side to their respective timbers in the body-plan, and draw a curve line through those heights, and the top of the side will be represented in the body-plan. Then, to prove that the heads of the timbers make a fair longitudinal curve, transfer their half-breadths at the height of the top-side in the body-plan to their respective timbers in the half-breadth plan; that is, from frame D forward, and from 10 abaft; if they produce fair curves, the top of the side is correct.

Now the side stern-timber may be drawn in the body-plan, thus: transfer the height of the wing-transom, lower counter, upper counter-knuckles, top timber-line, and top-side, from the side stern-timber in the sheer-plan to the after body-plan, and draw an horizontal line at each height; draw likewise two horizontal lines, equally spaced; between the wing-transom and lower counter-knuckle, and one equally between the upper counter-knuckle and the top timber-line. Transfer the half-breadths of the six after-frames, where they are intersected by the above horizontal lines, to their corre-

corresponding timbers in the half-breadth plan, and draw curves through the above half-breadths, some distance abaft the after-frame; then square down where the several heights intersect the side stern-timber in the sheer-plan, to the half-breadth plan on their corresponding lines, and from thence transfer the several half-breadths to their corresponding heights on the body-plan; then, by drawing curves through those half-breadths, the side stern-timber will be represented.

The main half-breadth and top-timber half-breadth lines may now be ended abaft in the half-breadth plan: thus, square down from the sheer-plan, where they intersect the side stern-timber, to their corresponding lines in the half-breadth plan; also, where they intersect the middle stern-timber in the sheer-plan, square them down to the middle line in the half-breadth plan; then, with a radius in the said middle line, sweep an arc of a circle to intersect the spots last squared down, which will represent the round-ast of the stern at the main half-breadth and top timber-lines in that direction.

In a similar manner may be drawn the round-up of the stern at the knuckles of the lower and upper counter in the body-plan, by transferring the heights of the lower and upper knuckles, at the middle stern-timber in the sheer-plan, to the middle line in the body-plan; their height at the side being set up before; then, with a radius from the middle line in the body-plan, sweep a segment of a circle to pass through each height, and the round-up of the stern, at each counter, will be represented as in the body-plan, *Plate I.*

Apron, or Inner Stem, &c.

The apron may now be drawn in the sheer-plan, by continuing a line parallel to the aft-side of the stem, at twelve inches, its moulding from the head of the stem, to about seven feet abaft the boxing, by which it will give shift to the scarfs of the stem, as represented by the ticked line in the sheer-plan, *Plate I.*

The cutting-down, or height of the upper side of the floors in the middle fore and aft, is represented by the ticked line at the following heights; viz. at \oplus , and from frame D to 8, 1 foot 10 inches; at F, 1 foot $10\frac{3}{4}$ inches; at H, 2 feet $\frac{1}{2}$ an inch; at K, 2 feet 2 inches; at M, 2 feet $5\frac{1}{2}$ inches; at O, 2 feet $11\frac{1}{2}$ inches; at S, 4 feet 6 inches; at U, 6 feet 6 inches; at 10, 1 foot $10\frac{3}{4}$ inches; at 12, 1 foot 11 inches; at 14, 2 feet; at 16, 2 feet $1\frac{1}{2}$ inch; at 18, 2 feet 2 inches; at 20, 2 feet 6 inches; at 22, 2 feet 10 inches; at 24, 3 feet 2 inches; at 26, 3 feet $10\frac{1}{2}$ inches; at 28, 4 feet $7\frac{1}{2}$ inches; at 30, 4 feet 11 inches; at 32, 7 feet 7 inches; at 34, 10 feet $1\frac{1}{4}$ inch, above the upper side of the keel; then a curve line drawn through those heights, will shew the cutting-down.

The depth of the keelson is also represented by a line eighteen inches above, and parallel to the cutting-down, into which forward is scarfed the stemson, which is continued upwards to the under side of the gun-deck hook, and nearly parallel to the apron, it being ten inches moulded at the head. The after-end of the keelson is completed by the sternson-knee, which scarfs into the keelson, and runs up the fore side of the transom to the under side of the carling under the gun-deck beams, as shewn in the sheer-plan, *Plate I.* Sometimes a knee is introduced in the dead-wood, as shewn in the sheer-plan, which lays against the inner post, which is fifteen inches moulded at the heel, and one foot at the head at the under side of the gun-deck transom.

Nature and Use of the Timbers, when canted.

Hitherto we have considered the timbers as having their

planes athwartships, or at right angles, square to the keel, and have consequently called them *square-timbers*. But the *cant-timbers* have their planes inclined forward from the keel in the fore-body, and the contrary way, or aft, in the after-body, or *canted*, as shipwrights term it.

That the reader may clearly understand the nature of the cant-timbers, observe in the half-breadth plan, *Plate I.*, where the joint of cant-timber U intersects the middle line; at which place suppose it hung on a hinge, moving fore and aft; and also imagine the line drawn for the cant-timbers on the half-breadth plan to represent the upper edge of a surface, of a sufficient breadth to form the shape of the said cant-timber from the middle line in the body-plan; supposing the horizontal view of that surface to be represented by that one line. It immediately follows, that the surface must stand perpendicular to the upper edge of the keel, similar to a door swinging on its hinges; and, if we draw the moulding shape of the cant-timber, according to what is laid off in *Plate VII. fig. 3.* upon this surface, from the keel to the top of the side (not moving its position), and then cut it out, we shall have the true position of the cant-timber, as in its place on the ship, which will stand in a perpendicular direction; we may also, supposing it to be hung, swing it or cant it either forward or aft, and it will still maintain its perpendicularity with respect to the keel.

The canting of the timbers is of great utility, as it assists the conversion of the timber, and likewise greatly contributes to the strength of the ship in the fore and after parts. For in the first place, were all the timbers of the bow and buttock to be continued square, as those of the square body, though the scantlings of the square timbers on a square should be equal to the scantlings of the timbers, if canted, yet the bevellings of the bow and buttock-timbers would be so great, that the consumption, in some places, in order to get the timbers clear of sap, would be greater by one half than that in the timbers when canted. And, secondly, by canting the timbers gradually from athwartship line, we thereby bring each timber nearer to a square with the planks of the bottom, which is not only the best position to receive the fastenings of the planks, &c. but the timbers are also better able to bear those fastenings.

We may now proceed to cant the timbers of the fore-body, so that they may stand as square to the curvature of the bow as possible; which will not only greatly lessen the bevelling, but will very much straighten the moulding shape of the timbers; by which means they will be much stronger, not so liable to be grain-cut, and having less compass, the conversion will be greatly assisted.

Therefore determine on the cant of the foremost timber, which is y, by setting forward two feet one inch on the run of the main half-breadth line before the perpendicular of X, and its heel nine inches abaft the perpendicular of U, on the stepping-line, which is three inches nearer the middle line than the bearding, or half-thickness of the dead-wood, and draw the ticked line marked c y in the half-breadth plan, *Plate I.* The after cant-timber of the fore-body may be before the foremost square timber O two feet nine inches on the main half-breadth line, and the heel on the stepping-line two feet five inches before O, on the ticked line marked c p, drawn as before; then may the intermediate cant-timbers c q, c r, c s, c t, c w, c x, be drawn, with their joints to intersect their respective perpendiculars as far as U, at the main-breadth-line: then c w and c x equally between c u and c y: draw the ticked lines representing each cant-timber from thence to their heels, which are all equally spaced on the stepping-line, between c p and c y.

The *Hawse-pieces* can now be determined on and drawn in the

SHIP-BUILDING.

the half-breadth plan, the sides of which may stand parallel with the middle line, or canted square with the bow, which will lessen their heels and bevellings, and assist their conversion, as before observed, by the cant-timbers; their number may be four, besides the *knight-head*, which comes next the stem, unless the apron is sided more than the stem, which cannot be the case when the rabbet is in the middle: as that has now become general, a filling about six inches sided is fayed next the stem, which makes it unnecessary to cast the knight-head above the stem to receive the bowsprit. In the half-breadth plan, *Plate I.* the knight-head is drawn next the stem, therefore set off from the stem one foot four inches, its siding at the top-timber line or head; before cant *y* is introduced a short timber, which shortens the heel of the knight-head and hawse-pieces, not that the heels are expected to be gotten so low down as to lay against it, for if the knight-head runs down low enough to take a bolt through the gun-deck hook, it is reckoned sufficient, the remainder being made good with a chock. From the stem, at the timber or timbers before cant *y*, set up the siding of the heel, which is thirteen inches. In the same manner set off the siding of the hawse-pieces, four in number, from each other, as they lay close together, in wake of the hawse-holes; that is, 18 inches at the head for the first hawse-piece, 17 inches for the head of the second and third, and 18 inches for the fourth; and the siding at the heels to be all alike 13 inches, as in the half-breadth plan, *Plate I.*

The *hawse-holes* may now be drawn, which should be so stationed as to wound the hawse-pieces as little as possible; they may therefore be placed so that the middle or centre of the midship-hole may come in the joint of the first and second hawse-pieces, and that of the outer hole in the joint of the third and fourth hawse-pieces. The holes to be in diameter, *after the pipes are let out*, 17 inches, and in distance from each other on a square 18 inches, to which lines may be drawn in the half-breadth plan to extend from the thickness of the outside to the inside plank, and in a fore and aft direction, so as to cross the middle line of the gun-deck at the main-mast. Sometimes, to avoid wounding the hawse-pieces too much, middle pieces are introduced in wake of the holes sided, about six inches less than the diameter of the holes; then, by cutting three inches on the sides of the hawse-pieces between the holes, those hawse-pieces become consequently more sided, and are wounded proportionally, but little.

The hawse-holes may now be represented in the sheer-plan, thus; set up their height above the gun-deck, which is two feet eight inches, to their under sides, then their diameter above that, which will be clear of the clamps above; then, with a proper slide outwards, we shall find them about six inches above the upper side of the lower cheek, which will leave a sufficient substance of *bolster* under the hole for the wear of the cable. Square up, from the half-breadth plan, where the holes intersect the inside and outside plank at the main half-breadth line, that being very near their height; then by drawing lines to their slide parallel to their depth, they will be represented as the dotted lines in the sheer-plan, *Plate I.*; but to continue them to the outside of the bolster, as the shaded holes in the sheer-plan are, square up from the half-breadth plan, where they intersect the fore part of the cheek.

The cant-timbers in the after-body may now be drawn, and every part depending on them; in order to which we must first determine on the cant of the fashion-piece; therefore, having the round-aft of the wing-transom represented in the half-breadth plan, and likewise an horizontal line at the height of the wing-transom, set off sixteen inches, its

moulded breadth, at the side on the horizontal line, which is the station of the aft-side of the fashion-piece; then, to determine on the cant of it, the shape of the body must be considered, for the more it is canted the straighter will be the timber, and square with the plank of the buttock, consequently stronger and much easier obtained.

Therefore, let the heel of the fashion-piece at the aft-side be nine inches on the stepping-line in the half-breadth plan before perpendicular 34, and drawing a straight line from thence to the fore-side of the wing-transom, as above, the cant of the fashion-piece will be described, and will be found situated in the best manner possible to answer the before-mentioned purposes.

The cant of the fashion-piece being represented, the cant of the timbers before it may be easily determined; let 29 be the foremost cant-timber in the after-body, which, on the main half-breadth line, may be equally spaced between the after square-timber 28, and the perpendicular 30, and its heel on the stepping-line be one foot nine inches abaft 28, drawing a straight line, as before; the other cant-timbers between 29 and the fashion-piece, which are *c 30, c 31, c 32, c 33, c 34, c 35, and c 36*, may be equally spaced on the stepping-line at the heels, likewise on the main half-breadth line, drawing straight lines as before, which will intersect their perpendiculars as far aft as 34 on the main half-breadth line; thus the cant-timbers in the after-body will be represented as in the half-breadth plan, *Plate I.*

The line drawn for the cant of the fashion-piece represents the aft-side of it, as before observed, which lets on to the ends of the transoms; but, in order to assist the conversion with regard to the lower transoms, there may be two more fashion-pieces abaft the former; therefore the foremost fashion-piece, or that which is already drawn in the half-breadth plan, only takes the ends of the three upper transoms, which are the wing, filling, and deck-transoms; the middle fashion-piece takes the three next, and the after fashion-piece the three lower ones; therefore set off in the half-breadth the siding of the middle and after fashion-pieces, which is 12 inches each; then draw lines parallel to the foremost fashion-piece at the sidings, and the middle and after fashion-pieces will be represented in the half-breadth plan.

The fashion-pieces and transoms may now be represented in the sheer-plan, as the thwartship appearance of the fashion-pieces limits the length of the transoms as they appear therein: square up from the half-breadth plan, where the fashion-pieces there intersect the stepping, the horizontal or water-lines to their respective water or horizontal lines, and stepping-line, in the sheer-plan; but as the foremost fashion-piece runs up three or more feet, if to be gotten above the wing-transom, an horizontal line at the head, and three more between that and the load-water-line, should be drawn from the body to the half-breadth plan, in pencil, as they may be rubbed out afterwards, and the intersection of the fashion-pieces squared up as before; then curves drawn through the spots as squared up will represent the thwartship appearance of the fashion-pieces in the sheer-plan, as in *Plate I.*

The height and siding of all the transoms may now be drawn in the sheer-plan, thus; set down 13 inches below the horizontal line representing the upper side of the wing-transom already drawn, and draw a line parallel thereto, which will shew the siding or under side of the wing-transom as far forward as the fashion-piece.

The filling-transom is the next, which nearly fills up the vacancy between the under side of the wing-transom and upper side of the gun-deck plank, and may be represented by drawing two parallel lines under the wing-transom to its siding, which may be ten inches, if it will allow two inches between

SHIP-BUILDING.

between its upper side and the lower side of the wing-transom, and four inches from its lower side and the gun-deck plank. The deck-transom must be governed by the gun-deck, letting the under side of the gun-deck plank represent the upper side of it; draw another line at fourteen inches, its siding parallel to the upper side, which will complete the gun-deck transom. The transoms below the gun-deck, which are six in number, are all eleven inches sided, and are represented by drawing horizontal lines from the fore-side of the rabbet of the stern-post; the three upper ones to the middle fashion-piece, and the lower three to the after fashion-piece, keeping each of them about three inches asunder for a free circulation of air. Every means should be taken to preserve them, as they are more difficult to shift than any timbers in the ship.

The stern-post may now be completed, by drawing the fore-side thus; set forward upon the upper side of the keel three feet from the line, representing its aft-side, and likewise twenty inches at the head, which may be three feet above the wing-transom, which will admit of the tiller to be three inches clear of the helm-port transom, and two inches from the under side of the beams above; then a straight line drawn from the heel to the head to the dimensions set off, will represent the fore-side, observing not to draw the fore-side of the post through the transoms.

The *inner post* may be drawn by setting off before the main post sixteen inches, its size at the upper edge of the keel, and thirteen inches at the head, which comes no higher than the under side of the gun-deck transom; then, by drawing a line, as before, for the fore-side of the main post, the inner post will be represented as in the sheer-plan, *Plate I.*

To Design the Perpendicular View of the Stern.

In designing the perpendicular view of the stern, there will be an opportunity of seeing whether the knuckles of the counters are so disposed, that the lower and second counters are in proportion to the rest of the stern: at the same time, whether the heights of the decks, which, in the present draught, *Plate I.* are sprung abaft sufficiently to give depth to the lights, as well as for other conveniences to make a well-proportioned stern.

Draw an horizontal line at the upper side of the wing-transom at the middle line, in the sheer-plan, body-plan, and likewise for the stern underneath the body-plan, as the basis of the stern, from which all the heights will be set up or transferred. Continue down thereon the middle line of the stern from the body-plan, and drop perpendiculars from the knuckles of the side counter-timber in the body-plan, to the base line in the plan of the stern, and then draw the side counter-timber on each side the middle line, the same as in the body-plan above, and the round-up of the upper and lower counter at the knuckles of each timber. Having the form of the side counter-timbers in the plan of the stern, set within them the scantling of the timber, and draw their insides.

The lower and upper counter-rails being drawn in sheer-plan, try if the under sides at the midship-timber project enough to bury their respective counter-planks, thus; square aft a line from each counter at the knuckle, and on those lines set aft from the knuckle the thickness of the counter-plank, say three inches at the lower counter, and one quarter more, that the moulding may not come to a sharp edge. The lower counter-plank may be increased to four inches, its general thickness. Proceed in the same manner with the upper counter, its birthing being two and half inches thick. This will shew how much the light-part of the rails will be on a level view below the knuckles of the timbers. Then transfer their height to the plan of the stern at the middle,

and keep them parallel to the knuckles to the outside, sufficient for the projection of the quarter-galleries, as in plan of the stern, *Plate I.*

Take the height of the under side of the quarter-deck at the aft part of the middle stern-timber in the sheer-plan, and set it up in the plan of the stern at the middle line; then round the quarter-deck in the stern, agreeable to the upper counter-rail, in the following manner: take the height from the upper counter-rail, in the plan of the stern, to the quarter-deck at the middle line, and set it off in the direction of the side-timber at the inside. This makes the quarter-deck round more than the upper counter-rail, and adds life to the stern; for the upper part of the lights in the stern should be parallel to the transom. As, if they were to round by the same mould as the upper counter-rail, the bars in the fashies next the side would be longer than those in the middle line, and would appear as if the top of the lights rounded less than the upper counter-rail. Draw in the upper part of the lights about an inch and half below the under side of the quarter-deck transom, and their lower part about six inches above, and parallel to the upper counter-rail, which will allow sufficient depth for the water-table. Set off within-side the stern-timbers, in the plan of the stern, the thickness of the clamps, and the projection of the cornice in the cabin, and let that be the side of the lights.

Then determine on the breadth of the munions, allowing sufficient for the weights and pulley-pieces, and divide the fashies, six in number, equally.

Now, as well-proportioned lights are great ornaments in sterns, having the breadth of the lower part of the lights in the clear, let their depth be at least one-third more than the said breadth; set off upon the rake of the stern-timbers, in the sheer-plan, and transfer that to the plan of the stern, which makes a good proportioned light. Set off likewise the mock-light in the aft part of the quarter-gallery the same size as the rest.

Then to rake the fashies regularly from the middle to the sides, continue upwards the middle line and the outside of the side stern-timbers in the plan of the stern, till they intersect at the said middle line; then from their spacings at the lower part, the sides of the lights may be drawn to their heads, or upper part, with a straight batten fixed at the intersection of the middle line. In the same manner may all the intermediate stern-timbers be drawn to their siding in the middle of each munion from the wing-transom to the under side of the quarter-deck, likewise the shorter ones that make the side of the counter-ports, and those under the middle of the lights to the upper counter-rail. At about half the breadth of the munions from the mock-light, place the inside of the quarter-piece; then set off at the heel sixteen inches, its moulded breadth, and continue upwards the outside of the quarter-piece, as before, for the lights. In the middle of the quarter-piece, or nearly so, place the outside of the gallery, which determines the projection of the gallery from the side. Draw in the plan of the stern the foot-space rail, its under side to be about an inch and a half below the aft part of the quarter-deck, and parallel thereto to the outside of the quarter-piece; likewise draw the breast-rail, transferring its height from the sheer-plan at the after-part, and set it up at the middle line as in the plan of the stern, and rounding it, as described for the quarter-deck, to the inside of the quarter-piece. Then let the round-house deck be drawn in the plan of the stern as directed for the quarter-deck, which will determine the lower part of the taffrail, as the necking-moulding should be kept an inch and a quarter below the round-house transom. Then may the boundary, or upper part of the taffrail and quarter-pieces, be finished as in the plan of the stern,

stern. In the starboard quarter-piece is designed the aft part of the gallery, which is at the middle of the quarter-piece in the sheer-plan; therefore it will be proper to draw the form of the middle of the quarter-piece, and the fore-side of the taffrail, upon the sheer-plan. Thus, take the heights from the level line at the upper side of the wing-transom in the plan of the stern, to the lower part of the quarter-piece, or upper side of the upper counter-rail, and likewise in as many places as may be found necessary, to get the exact form, and set them up in the sheer-plan, drawing level lines. Square up the spots on the quarter-piece and taffrail to the round-aft of the stern on a level; then take what the round gives at each spot squared up, and set it off from the midship stern-timber on their corresponding level lines in the sheer-plan. This produces the ticked line that was drawn in pencil in the sheer-plan, shewing the middle of the quarter-piece and fore-side of the taffrail. Take the siding of the taffrail, and draw the aft-side of the taffrail and quarter-piece parallel to the middle line of the quarter-piece, and fore-side of the taffrail, and draw likewise the fore-side of the quarter-piece parallel to the middle. By the same method, prove the thwartship view in the sheer-plan of the lower side of the taffrail, and inside of the quarter-piece.

Take the height in the plan of the stern of the upper counter-rail at the outer part, and set it up in the sheer-plan, drawing a level line. But to find how much the after-end of the rail will be before the knuckle of the upper counter at the side-timber, the round-aft of the upper counter-rail must be laid down on a level, as in the half-breadth plan; transfer the outer end of the said rail square from the middle line in the plan of the stern, on to the round-aft square from the middle line in the half-breadth plan; then square it up to the sheer-plan, on the level line last drawn. Design the lower gallery rim, with the lights and munions, as in the half-breadth plan, which is a continuation of the upper counter-rail, and this will determine the length of the gallery in the sheer-plan. Take the height in the plan of the stern to the foot-space rail, at the outside of the quarter-piece, and transfer it to the aft-side of the quarter-piece in the sheer-plan. Take likewise the upper and lower part of the lights in the plan of the stern, at the birthing of the outside of the gallery, and set them up in the sheer-plan, at the ticked line, for the middle of the quarter-piece. Design the lower finishing as in the plan of the stern, and transfer the height and round-forward of the lower counter-rail, as before described, at its outer end, and then draw all the rails and lights, as set up in the sheer-plan, from thence forward, agreeable to the sheer of the ship, to their boundary, or fore part of the quarter-gallery.

Lastly, the upper finishing being designed in the sheer-plan, transfer their heights, and complete the quarter-gallery, as drawn in the starboard quarter-piece in the plan of the stern, *Plate I.*: the aft-side of the rudder, counter-ports, and helm-port transom, may also be drawn.

To Design the Plan of the Head.

Continue forward the middle line of the half-breadth plan. Upon it square down the fore-side and aft-side of the figure from the sheer-plan, and upon those lines set off the half-siding of the figure.

Then draw the main rail to its half-breadth appearance, thus: set off the siding of the after-end of the main rail from the outside of the plank at the top-timber half-breadth, to the fore-side of the beak-head in the half-breadth plan; and also the siding of the fore-end from the outside of the figure, the fore-end being square down from the fore-part of

the hair-bracket in the sheer-plan; observing, however, to add to the siding the thickness of the lining: then, by drawing straight lines to those spots, the half-breadth plan of the main rail will be represented as in *Plate 1.*

Square down from the sheer-plan the head-timbers, where they intersect the under side of the main-rail, to the middle line of the half-breadth plan: likewise square down the fore and after-sides of the knight-head, and draw the half-breadth line at the upper side of the beak-head-flat, and the thickness of the outside plank.

Square up from the middle line in the half-breadth plan the head-beam, so as to let aft about two inches upon the stem; and square up likewise the cross-piece close to the aft-side of the foremost head-timber, to which and the head-beam the main rail is secured by knees on the aft-side.

Draw the moulding size of the upper cheek as you see the ticked line in the half-breadth plan, then the half diameter of the bowsprit parallel to the middle line; and also the fore and aft carling as much without the bowsprit as the gammoning may lead down clear of the bowsprit, and outside of the upper cheek.

The seats of ease, no less than two double ones, should be placed the most conveniently, as shewn in the plan. The remaining space of the flat of the head may be composed of ledges: and, lastly, may be drawn the boomkins, which spread the fore-tack, thus; square down from the centre of the fore-mast from the sheer-plan to the middle line of the half-breadth plan, and from that intersection draw a line forward, to form an angle of thirty-six degrees with the said middle line; and upon it set off half the length of the fore-yard; then draw in the boomkin parallel to the line representing the fore-yard braced up sharp, and it will come nearly over the middle head-timber on the main rail, its heel resting against the knight-head; the length may be ascertained by a line drawn from the fore yard-arm at the outer end.

The round-houses, or seats of ease for the officers, are clearer shewn in the plans of the upper deck and forecastle; which plans and draught of the inboard works will be designed hereafter, the sheer-draught plate being completed.

To Design the Disposition of the Frame. Plate II.

The utility of a plan of this description requires but little explanation; as it is evident, upon inspection, that it exhibits the disposition and shift of every timber, and consequently affords the means of disposing of every piece to the greatest advantage, both with respect to the strength of the ship, and to the conversion of the timber; and, moreover, of preparing every piece for its proper situation, before the ship comes on the stocks, with the greatest facility.

The frame-timbers are formed into bends, as before observed, by the union of first futtocks, second or middle futtocks, third and fourth futtocks, with top-timbers, which are severally scarfed together and bolted. Sometimes the frames are fayed close together, or separated, for air; those that are separated have dry pieces of oak fayed between them in wake of the bolts; these should all be split out before the planking is brought on, that a free passage may be given for the circulation of air.

By the disposition of the frames in their several stations, they stand respectively one on each side of every gun-deck port, by which the sides of every middle and upper deck port are likewise provided for. Thus, one fourth futtock and one long top-timber will form the side of every gun-deck port in two-decked ships, and the side of every upper deck port in three-decked ships. A long top-timber and a

SHIP-BUILDING.

fourth futtock will, in like manner, make the sides of the middle deck ports in three-decked ships, and the sides of upper deck ports in those of two decks.

With respect to the frame-timbers, it is, in the first instance, of the greatest consequence to the strength of a ship, that they should be cut as little as possible by the ports on each deck, scuttles, scuppers, &c.; and, secondly, that all the timbers designed to make the sides of ports, are, or should be, continued, if possible, without scarfing, up to the top of the side. Those timbers, however, in the sudden turn of the body, having so much compass in their length, and others which run up to receive the rough-tree rail having too great a length to be otherwise obtained, must be admitted to scarf, as shewn in the disposition, *Plate II.*

Those timbers that run up to make the sides of quarter-deck ports, fore-castle ports, or to the rough-tree rail, should, if possible, be made of timbers standing up on the upper deck fills, over the upper deck ports. The side along the waist, between the ports, may be filled in with fir timber, laid fore and aft, and dove-tailed into the frames.

All timbers in the range of the fore and main channels should run up to the top of the side; and the filling-timbers between each frame are all to be equally spaced between the frames; and all the openings between the range of the chain and preventer-bolts are to be filled in solidly with dry oak-fillings, as are also those over every gun-deck and middle deck port, that there may be solid boring in wake of the port-rope-pipes, and muzzle-lashing eye-bolts; also behind iron knees and standards. But as fillings of this kind interrupt the free passage of the air, let a hole, one inch and upwards, be bored throughout their length. All fillings should be charred, or burnt.

All ships should be as light as possible in their upper works, consistently with the services for which they are intended; and, as the frame should not be incumbered with more short timbers than are absolutely necessary, two timbers over each point are sufficient. The frame will be adequately full, and every purpose answered, when timbers are provided to form the gallery doors, and to fill in the quarters from the after-frame to the side stern-timbers; and forward, from the foremost frame to the hawse-pieces.

Having considered the several subjects above-mentioned, transfer from the sheer-draught, *Plate I.*, the keel, likewise the stem and stern-post, with the transoms, and stepping-line for the heels of the cant-timbers, the under side of the decks at the side, also the ports, the plank-sheers, rough-tree rails, and beak-head; then the side stern-timber.

Square up from the half-breadth plan, *Plate I.*, the joints and sidings of the cant-timbers, where they intersect the water-lines, main and top-breadths, and plank-sheer, to their respective lines in the sheer-plan, as *Plate I.* at *c*, *u*, in the fore-body, and at *c*, *32* in the after-body. Thus may their thwartship appearance be transferred to the disposition, *Plate II.* In the same manner may be squared up the thwartship appearance of the knight-head and hawse-pieces, which may likewise be transferred as the rest, and also the hawse-holes.

The height of the heads of all the timbers may now be taken above the base line in the body-plan, *Plate I.*, and transferred to their respective timbers above the upper edge of the keel, in *Plate II.* Curves being drawn through those heights, will shew the head of each timber on a perpendicular view in the disposition.

Now square up in the disposition the sidings of all the

timbers between the cant-bodies; and as the upper deck ports are less fore and aft than those of the gun-deck, the upper part of the frame-timbers must be opened so much from the joint. The frame-timbers may now be marked with their respective names, likewise the single timber dead-flat, where the body turns to shift the floors, as they are always under-bevelled.

The fore-side, or moulding of the side stern-timbers, may be drawn, and the gallery doors from the sheer-plan, *Plate I.* Then the fills, and all the timbers necessary to frame the quarters abaft frame 36.

The ports being drawn, their fills may all be represented; making the upper fills in wake of the chain-bolts much deeper. Then the blocks through the side should be drawn, that the long timbers may not be provided, and afterwards cut afunder by those blocks; namely, the main tack-block between D and B, the fore sheet-block between 4 and 6, and the main sheet-block between 24 and 26.

The fourth futtocks being the longest timbers in the ship, and, from their shape, very difficult to be gotten of the whole length, especially for ships which have much tumble-home, or even long enough to run up so as to make the side of the upper deck ports, particularly forward and aft, the sides of such ports should have their fourth futtocks scarfed together with a hook and butt, as at fourth futtock 26 in the disposition, *Plate II.*, giving shift to the port and each other: or, if preferred, the scarf sideways, as represented at fourth futtock O.

The third futtocks that come under the gun-deck ports, are to be continued upwards to the under side of the fill, as at D. But when the third futtocks, owing to their great compass, cannot be gotten so long, they may be scarfed, as at 4, observing always to get them longer than the regular shift.

The design of *Plate II.* is to have at one view every timber on one side the ship, that the utmost care may be taken to reduce every timber to the shortest length admissible; as, in a disposition of this kind there is every opportunity of so doing; and likewise of pointing out and converting to the best advantage the most scarce and valuable timber.

The Design of Expanding the Bottom and Top-side. Plate III.

The design of expanding the bottom and top-side, is to have the lengths and breadths of all the planks at one view, that the planking may be shifted agreeable to the lengths to be obtained, so as to run no hazard of beginning with a shift of planking that could not afterwards be continued. For the planking of a ship is a branch so very material, that, unless it be judiciously performed, it will unavoidably be very injurious to, or subversive of, those good qualities that might be expected from the superior construction of the ship. The planking ought, therefore, to be particularly well performed: as, in the proper shifting, fastening, and caulking, the goodness of every part of the materials for that purpose should, consequently, be very carefully inspected.

The length of plank is a very great object to be considered; and, in the shifting, it is principally to be observed. For English plank it is allowed, and hath generally been found to answer, that if three whole planks be wrought between every two butts on the same timber, and all the butts to have a six-foot shift, or be in distance from each other six feet, the planks will only be twenty-four feet long: this shift is generally followed, excepting for the wales, &c. for ships of every class in the royal navy. But as English oak-plank, having sufficient breadth at the tops in that length, has become exceedingly scarce, merchant-ships have the planks

SHIP-BUILDING.

planks shifted of various lengths, according to their thicknesses; as two and a half and three-inch plank to have a six-feet shift, and two planks between; and four-inch plank and upwards, to have a five-feet shift, and three planks between every two butts on the same timber. It is possible, however, to have a very bad shift, and yet have three strakes between every two butts on the same timber: that is, when the butts rise one above another in a regular manner, like steps; for, as the upper butts, or those in the top-side, are the most likely to give way, all below would be inclined to follow; as, if the ship begins to break her sheer amidships, it is most probable that the butts afore and abaft would yield proportionably; therefore, let one of the butts between have a double shift, or extend twelve feet; then will the stepping of the butts before mentioned be prevented, and the planks be twenty-four feet long.

The *wales* must be wrought of such length, and the butts shifted, so as to give the strongest shift to the ports and each other. To do this, some of the planks in midships should have a three-port shift; that is, should over-launch three ports; being careful, in large ships, to make one butt answer for the pump-dale scupper. To assist the conversion, the planks may be wrought top and butt. When the wales consist of four strakes, they have a fair seam in the middle; but if wrought in three strakes, let the two lower strakes be worked top and butt, and the upper strake of a parallel breadth.

The *thick-stuff*, or diminishing strakes, from the lower edge of the wale to the thickness of the bottom plank, being of English oak, is wrought top and butt, and should be shifted from the butts of the wales to the regular lengths of the bottom plank as soon as possible.

The *plank of the bottom* is English oak-plank; as low as the light water-mark, and below that, may be East country plank of the best quality. The English plank is worked top and butt, to twenty-four-foot lengths at least. Now, to break the shift, so as to work East country plank to advantage, requires care; for, as just observed, the general shift of English plank is twenty-four feet, whereas East country plank is from thirty to fifty feet; consequently, the best way is to work a double shift at first, or one of forty-eight feet in length. It rarely happens that the shift is broken from English plank to East country plank, without introducing two planks between two butts on the same timber in some places; and, it may be admitted, owing to the superior length. Be careful, in shifting the East country plank, to keep the shift as nearly equal as possible, not being confined to butt on one timber, but to make an advantage of drawing the butts having no less than a six-feet shift.

East country plank is wrought of a parallel breadth from ten to eleven inches, excepting forward and aft; for the fore and after-hoods that come into the rabbet should be English oak-plank. Four or six strakes nearest the keel may be of elm or beech, observing to shift the butts clear of the scarfs of the keel; and, likewise, that no butt is placed under the pumps, and to work them very broad at the post. The edges and butts of the six or eight strakes next the keel in East India ships, are rabbetted close; and fine flannel, dipt in tar, is put between, and thick kersey, also dipt in tar, is spread between those planks and the timbers.

In planking the fore part of the bottom, the breadth of the strakes must be considered, and also the shape of the bow, that every strake of plank may be brought into the rabbet; and every plank should be kept from slying as much as possible. But, in full-bowed ships, it would be impossible to bring every strake to the stem without too

much sly. It is, therefore, customary to work in the bow of such ships a drop-strake next under the wale, or more, if necessary, and a steeler at about four strakes under it; by which means all the strakes that come in the rabbet will be of sufficient breadth. In order to take out the sly, bring the steeler well forward. In most ships, a drop-strake abaft, close up under the wale, assists the planks very much; and to produce a fair edge, be careful not to work too broad on the fashion-piece.

The *plank of the top-side* is generally wrought in parallel breadths, therefore it had better not be more than nine inches broad. The top-side, being cut by the ports, drifts, &c. requires the greatest strength to be given to it in shifting the plank; as no butt should be placed immediately over or under a port, unless there are two planks between. The planks in wake of the main-mast should have a three-port shift; the others, afore and abaft, may have a two-port shift. As it is stronger to butt between the ports, it may be allowed sufficient to have a shift of 5 feet 6 inches, where a plank comes between; or five feet, where two come between. But there should not be less than a six-feet shift where no plank comes between. The channel and sheer-wales, in large ships, should work down to the stops of the ports in midships; and, where the sheer lifts forward and aft, should work down to as many ports as may leave sufficient stop, and afford wood to receive the port-hooks, letting the wood so worked down be continued six inches each way beyond the stops of the ports; thence to hance one foot to the regular breadth: but, by all means, let planks run through, if they hold but five inches after the stops are cut, so as that the port-hooks will clear the seam; for planks, however broad, working down to the ports, make that part no stronger than any other.

Forward in wake of the hawse-holes, the planks should be so wrought as to have the seam to cut the plank as little as possible by the holes; and care must be taken that no seams come behind the cheeks.

The sheer-strakes, as they are the greatest strengtheners of the upper part of the top-side, should have their butts disposed with the utmost care, in order to produce the greatest strength between the drifts, and give the strongest shift to each other. They are wrought of parallel breadths, with hook and butt scarfs about four feet long between the drifts. The butts afore and abaft may be square, especially behind the channels, which should be of English oak. The others, owing to their great lengths, must be of East country plank.

Observe; if the channel or sheer-wales are in three strakes, two of them may be wrought top and butt, to assist the conversion.

In *planking the inside*, attention must be paid that the butts of the clamps, spirkittings, and strings in the waist, should give shift to the butts outside.

Clamps, when wrought of a single strake, should have hook and butt scarfs about four feet long.

Gun-deck clamps and spirkitting should have a three-port shift in midships, as should likewise those of the middle and upper deck. Clamps and spirkittings, when wrought in two strakes, may work top and butt, and one butt of the latter is to come in wake of the pump-dale scupper.

The clamps of the lower deck cannot be wrought towards the after part of the ship, agreeably to the hang of the deck, so as to admit of the after-beam's coming home to the timbers, as it would wound them too much, or produce too great a sly; therefore the clamps may lift aft to produce an easy edge, and some of the after-beams, of course, must face on the clamps.

SHIP-BUILDING.

However desirable a three-port shift may be with regard to strength, planks of that length are hard to be gotten; therefore, to add security to a two-port shift, let the plank below or above the butt be douelled into each timber next the butt, and likewise edgeways, keeping the douls clear of each other.

To design on a plan the body of the ship, shewing the lengths and breadths of all the planks as near as is required for practice, will be found by experience to be necessary; for when the ship is planking, without a plan of this sort to assist, it is requisite to girt the body in several places, to know the number of strakes the bottom will require, in order to work the planks of each quality of an equal breadth, and likewise to know the diminishing of the breadths of the planks forward and aft. To do this satisfactorily, without a plan, is attended with much inconvenience and trouble. It also affords an opportunity of not only shifting the work before it be immediately wanted; but by having the whole shift of the bottom and top-side before you at one view, you have a better opportunity of seeing whether the butts are sufficiently clear of each other, which is better than seeing them on the ship's side. And when the ship is planking, if there should be any lengths which may prove difficult, you may, by referring to the plan, see if the butt can conveniently be altered, without prejudicing the shift that is not wrought; some part of which it is likely may be altered to conform thereto.

The bottom may be expanded by the horizontal or water-lines, also by the ribband-lines; therefore, from the sheer-plan, *Plate I.*, may be taken the station of all the timbers, and the lower edge of the rabbet of the keel, from the aft-side of the rabbet of the stern-post, to as far forward as the rabbet of the keel continues straight, that is to timber M; likewise the scarfs of the keel; all of which are to be set off on the plan of expansion, as in *Plate III.* Then to expand the square body, transfer the heights of the upper and lower edge of the main-wale, channel-wale, sheer-strakes, upper and lower sides of all the ports, the height of the decks at the side, and under side of the plank-sheer, from the sheer-plan, *Plate I.*, to the body-plan. Transfer from the body-plan the half-breadth of the timbers at the upper and lower edge of the main-wale, channel-wale, sheer-strake, and under side of plank-sheer, to the half-breadth plan, and draw in the lines to their half-breadth; which being done, apply to those lines, and also to the horizontal or water-lines, narrow slips of paper, confining them thereto by needles or small pins, from dead-flat forward to square timber O, and from thence abaft to 28; marking upon each slip of paper the station of every timber, and its respective water-line, &c. as girted.

In the same manner, girt the timber dead-flat in the body-plan, *Plate I.*, from the inside of the rabbet of the keel to the under side of the plank-sheer or gun-wale; then mark upon it the heads of the timbers, water-lines, upper and lower edges of the wales, and ports; likewise the decks at the side and under side of the plank-sheer. Then square up the station of dead-flat, as shewn on *Plate III.*; and upon that line set up the middle of the rabbet, to which spot fix, with a needle, the spot corresponding thereto on the slip of paper that girted dead-flat; then upon the line mark off from the said slip the water-lines, heads of the timbers, upper and lower edges of the wales, ports, &c. In the same manner proceed to girt every square timber in the body-plan, *Plate I.*, marking thereon the name of its respective timber. Then fix the spot marked for the middle of the rabbet of each girt, to the middle of the rabbet of its respective timber in *Plate III.*

Now fix the girt of each water-line, &c. as taken from the half-breadth plan, to its corresponding height, as marked on dead-flat, *Plate III.*; then stretch each girt, observing it does not pucker, in such a manner that the stations of the timbers, as marked on the girts of the water-lines, &c. and their corresponding heights, as marked on the girt of each timber, may intersect each other; then with needles confine them in that situation, and make dots at every intersection, which will represent the expanded heights and lengths of all the water-lines, main-wales, &c. in the square bodies. Fair curves may then be drawn through all these dots, which will shew the square bodies expanded from 28 aft to O forward.

Then, to expand the cant-bodies afore and abaft, proceed to draw in pencil the joints of the cant-timbers in the body-plan, *Plate I.*; thus, lay a slip of paper in the direction of each cant-timber in the half-breadth plan, and mark on it their intersection at each water-line, main-wale, channel-wale, ports, sheer-strake, and plank-sheer; also the middle of the rabbet of the keel and stem, and middle line. Then transfer each timber so marked to the body-plan, *Plate I.*; and mark on each corresponding line their half-breadths from the middle line; then curves drawn through those spots will represent the joint of each cant-timber from the keel to the top of the side. In the same manner draw the sides of the short timber before cant y.

The thwartship view of the joints of all the cant-timbers being represented in the sheer-plan, *Plate I.*, square up from the half-breadth plan the fore-side of cant y and the timber before it, and likewise the sides of the hawse-pieces, where they intersect the water-lines, main-wale, &c. to their corresponding lines in the sheer-plan. Then drawing lines in pencil through the spots so squared up, the thwartship view of the hawse-pieces, and the cant-timber before y, will be also represented in the sheer-plan.

Now draw in pencil the fore and aft view of the hawse-pieces in the body-plan, *Plate I.*, by setting off their siding at the heads and heels from the side of the stem, and draw straight lines to intersect the fore-side of cant y and the timber before it; then transfer the height of the heels from the sheer-plan, where they cut off against the foremost timbers, to the same timbers in the body-plan, as in *Plate VIII. Laying-off B, figs. 1 and 2.*

Transfer the heights of the main-wale, &c. where they intersect the joint of the cant-timbers in the sheer-plan, *Plate I.*, to their corresponding timbers in the body-plan. Then with slips of paper girt the cant-timbers, as before, for the square ones, marking all the heights set off, and the heels where they cut the stem forward and those abaft on the keel.

Likewise girt each water-line, main-wale, &c. from square timber O, in the half-breadth plan, round to the stem, marking thereon the joints of all the cant-timbers, the sides of the hawse-pieces, and stem; then girt the stem in the sheer-plan from M, marking O, the heels of all the cant-timbers, and the heights of the water-lines, wales, &c.

Then place the girt of the stem on *Plate III.*, confining it at M; and likewise fix all the girts of the cant-timbers in the fore-body, confining their heels respectively to their stations on the stem; also the girts of each water-line, wales, &c. confining them respectively at square timber O; then move the whole till they all agree, that is, the ends of the water-lines, &c. are to agree with their respective heights on the girt of the stem, confining them with pins till the whole of the fore cant-body agree, and as much as possible let them lie smooth, without puckering. Then may be marked on the plan the proper edges of the slips of paper, which

SHIP-BUILDING.

which will represent the moulding edges of the cant-timbers, the water-lines, wales, &c. Likewise mark the heads of the timbers, as taken from the body-plan, as the slips now lie, which heads may be drawn when the slips of paper are taken up.

The sidings of all the timbers may then be drawn from their moulding edges, and the openings shewn where required for air, or to make the sides of ports, observing to taper the heels of the cant-timbers on the stepping-line.

The operation of expanding the after cant-body is so similar to the above as not to need repetition; therefore, supposing the after cant-body to be expanded as far aft as the fashion-pieces and stern-timber, there only remains to be explained the expanding of the transoms.

The buttock-lines being drawn in the several plans of *Plate I.*, proceed to draw in pencil the moulding edges of the transoms in the half-breadth plan, thus: lay a slip of paper in the direction of the upper edge of each transom in the sheer-plan, and mark thereon where they cut each buttock-line fore-side of the rabbet of the stern-post, and the after perpendicular.

Square down the after perpendicular to the half-breadth plan, and therefrom set off each transom on its corresponding buttock-line, and the rabbet on the half-thickness of the post. Then draw curves through those spots, till they intersect the aft-side of the fashion-pieces, and the moulding edges of the transoms will be represented in the half-breadth plan.

Now draw in pencil the transoms and buttock-lines, where they cross the aft-sides of the fashion-pieces in the body-plan, by transferring their heights from the sheer-plan, where they intersect the thwartship view of the fashion-pieces on the aft-side.

Provide narrow slips of paper, as before, and extend one round the aft-side of each fashion-piece in the body-plan, *Plate I.*; and mark thereon where the upper sides of the transoms and buttock-lines cross them. Then place other slips round the moulding edges of the transoms, below the wing-transom in the half-breadth plan, marking the aft-sides of the fashion-pieces against which the transoms cut off, and the several buttock-lines, as also the side of the stern-post, or inside of the rabbet, which is the extreme length of the planks when worked. Then extend other slips of paper round the several buttock-lines in the sheer-plan, *Plate I.* and mark on them the aft-sides of the fashion-pieces, and the moulding or upper edges of all the transoms below the wing, and likewise the margin-line of the wing-transom, which is the end of the buttock-lines and planks also. Then place the slips of paper as on *Plate III.*, those for the heights of the transoms and buttock-lines to the aft-sides of the fashion-pieces, respectively marking their heights, to which fix those for the buttock-lines and moulding edges of the transoms to correspond; then move both the latter, till their corresponding spots agree together, and so confine them with pins: then mark the proper edges of the slips of paper, which will give the expanded form of the moulding edges of the transoms, and likewise the buttock-lines as they properly intersect the transoms. The farthest spots on the papers of the transoms give the boundary of the stern-frame at the inside of the rabbet, and the farthest spots on the papers of the buttock-lines and the margin, of the wing-transom.

In the same manner may be taken off the lower edges of all the transoms, and draw the upper part of the wing-transom, which makes the stern-frame complete.

Take a slip of paper, and place it up the rabbet of the stern-post, in the sheer-plan, *Plate I.*, and mark on the paper the lower edge of the rabbet of the keel, the three

lower water-lines, and the lower edge of the lower transom; then place the slip of paper as in *Plate III.*, keeping the spot for the lower edge of the rabbet well with its corresponding spot on the keel; and move the slip of paper, till the marks for the water-lines and lower edge of the transom agree with their extremities; then, by marking the edge, the post will be described, and the boundary of the planks below the transom.

The operation may be performed by the ribband-lines, as well as by the water-lines, as before observed; but in that case, the cant-timbers must have been drawn in the body-plan, *Plate I.*, on the square as well as on the cant, to level through their proper heights, which was omitted, to prevent confusion: nevertheless the lower ribband is represented in *Plate III.*

The whole side being now expanded, the planks of the bottom and wales may all be represented, agreeable to the foregoing directions. Likewise, on the top-side we have an opportunity of seeing the distance of every seam from the port-fills, whereby you may judge whether it is better to cut down upon the strakes for the ports, or to work the strakes somewhat broader, to correspond with the stops of the ports. This should be carefully examined, otherwise you will be under the necessity of making a bad shift in the top-side; or be forced to cut so low down upon the lower strake, that the bolts, which are driven through the lower fills, will be of little use; and also to cut up so much for the upper part of the ports, that there will not be left sufficient wood for the port-hooks to bear the weight of the ports; inconveniences which ought to be well considered, before it be too late to alter them.

The strength of the ship, with respect to keeping her from breaking her sheer, chiefly depends on the shift of the planks from the water to the gun-wale, of which the greatest care should be taken to make the best possible, agreeable to the usual lengths of the planks; and likewise that the inside plank, especially the strake above and below the ports, should be shifted as clear as possible of the outside strakes.

The longer the planks in the top-side are wrought, the stronger must be the work; but then it would be imprudent to work longer than the usual length of the planks, because when the ship wanted repair, you would be forced to cut plank on purpose, and thereby work green plank instead of seasoned. The breadth of the planks should be consulted, before you determine on the number of strakes in the top-side, as before observed; for if the planks are rather narrow, the top-side will look the neater, and be equally as strong, if not bored too much.

To design the Profile, or inboard Works of the 74-Gun Ship, with Observations on the inboard Works of Ships in general.
Plate IV.

Sometimes the inboard works are drawn in the sheer-plan of *Plate I.*; but when so drawn, they appear so confused, that the best and readiest method is to appropriate a draught for that purpose, as *Plate IV.*, in which every particular will be more clear and conspicuous.

To construct this draught, it will be necessary to take from the sheer-plan of *Plate I.* the scale, keel and scarfs, stem, stern-post, rudder, counter-timbers, fashion-pieces, transoms, cutting-down line, keelson, apron, stemson, all the decks, and centres of the masts; also the drifts, plank-sheer all fore and aft, the joints of the frame-timbers, and the ports.

The stations of the beams are next to be considered, and should be so disposed as to come one under, and one between, each port, or as nearly so as possible, to answer the other

SHIP-BUILDING.

other works of the ship, as the hatchways, ladder-ways, mast-rooms, &c.; but where a beam cannot possibly be placed under a port, or too wide apart, then a beam-arm, or half-beam, should be introduced to make good the deficiency.

To dispose of the beams, as in the profile, *Plate IV.*, draw a fine pencil line under the deck-line at the side, and parallel thereto, to the moulding of the beams, which is for the gun-deck, 16 inches; upper-deck, 12 inches; quarter-deck and fore-castle, $8\frac{1}{2}$ inches; and round-house, 6 inches. Then place the first beam of the gun-deck under the middle of the first port, or nearly so; the second between that and the third, which takes the heels of the bowsprit-step; the aft-side of the latter to be 3 feet 10 inches before the centre of the fore-mast; the fore-side of the fourth to be 2 feet 6 inches abaft it; the aft-side of the fifth to be 10 feet 9 inches abaft the centre of the fore-mast, against which are the fore riding-bitts; the aft-side of the seventh to be 21 feet 10 inches abaft the said centre, which takes the after riding-bitts; the sixth comes equally between; the aft-side of the tenth beam plumbs the after-part of the fore-castle, or nearly so, and makes the fore-side of the fore-hatchway, which is 4 feet 10 inches fore and aft, and is made by the eleventh beam; the ladder-way between the ninth and tenth beam is 3 feet 2 inches in the clear; the aft-side of the twelfth beam is 5 feet 8 inches abaft the fore-hatchway; and the fore-side of the thirteenth 11 feet: between these two beams are let down the fore-jeer capstan-step. The fore-side of the seventeenth beam is 5 feet 8 inches before the centre of the main-mast, and makes the aft-side of the main-hatchway, which is 8 feet fore and aft, and is made by the sixteenth beam; the eighteenth beam is 9 feet 9 inches in the clear abaft the seventeenth; and the nineteenth 4 feet 10 inches in the clear, which makes the after-hatch; the aft-side of the twenty-first beam is 12 feet abaft the after-hatch; and the twenty-second 5 feet 6 inches in the clear abaft it, which takes the step of the main-jeer-capstan; from the twenty-third to the thirtieth are about 4 feet in the clear afunder. Between the twenty-third and twenty-fifth is the ladder-way to the cock-pit, and hatch to spirit-room; and the twenty-sixth beam should be placed exactly under the centre of the mizen-mast, all the beams having any thing attached to them being particularized. The intermediate ones may be equally spaced between them; and their sidings, which are 16 inches, may now be set off, and each beam be drawn. But as beams are seldom made of less than two pieces, the lips, which are four inches, had better be added to the siding.

On the *upper deck* the first beam is placed under the beak-head, to receive the tenons of the beak-head stantions; the second beam must be so fixed, as not to be too much wounded by the bowsprit; the third and fourth about 2 feet 6 inches in the clear on each side the centre of the fore-mast; the others, particularly those that have pillars under them, should be stationed over those of the gun-deck; from the fifth beam to the tenth is let up in the middle 2 inches of the fore-hearth carling, which is 12 inches square; between the tenth and the eleventh beam is the fore-hatch over the gun-deck, abaft which is a ladder-way, and next abaft it the capstan; the seventeenth beam takes the topfail-sheet-bitts on the aft-side; and the next beam before makes the fore-side of the main-hatchway, before which is a ladder-way about 4 feet 6 inches in the clear. The eighteenth beam on the fore-side takes the main jeer-bitts, and the next abaft makes the after-hatchway; between the twenty-first and twenty-second is the capstan-room, which should be at least 5 feet 8 inches in the clear, to admit the capstan. From the twenty-second to the twenty-fifth are gratings, and a

ladder-way to the gun-room, &c. The transom abaft scores in to the stem-timbers.

The *quarter-deck beams* having no framing of carlings and ledges as the others below, require nearly twice the number in the same length, and a greater round-up, otherwise they would be apt to bend with their own weight.

The length of the quarter-deck is determined by having the aft-side of the foremost beam about four feet before the centre of the main-mast, and in general receives the tenon at the heads of the main-topfail-sheet-bitts; the second beam is about 4 feet 6 inches abaft the centre of the main-mast, and receives the tenon at the heads of the main-jeer-bitts; of late these bitts are clear of the beams above the riding bitts; the other beams, in general as far aft as the mizen-mast, are kept about 2 feet 8 inches in the clear afunder. Between the third and fourth beams is a scuttle on each side for the top-tackle; from the seventh to the eleventh are gratings; and between the eleventh and twelfth a ladder-way for the officers. Fourteen and fifteen are placed about 1 foot 10 inches on each side the centre of the mizen-mast; and the thirteenth 3 feet 6 inches before fourteen, so as to receive the tenons of the steering-wheel stantions in the middle; the twenty-fourth beam is so placed as to receive the tenons of the munion of the screen-bulk-head, and sometimes rounds aft for the bulk-head to follow the round-aft of the stern, or nearly so. Against the fore-side of the stern-timbers, and scored aft into them, is a transom like the deck below, but having a balcony: the deals run aft to form the same.

The *fore-castle beams* should be four more in number than there are in the upper deck, in the length of the fore-castle; and where a wide opening occurs, such as the mast-room, a half-beam should be introduced, to make good the deficiency. The cat-beam is so placed that the stantions of the beak-head-bulk-head may face on the fore-side $1\frac{1}{2}$ inch; and when the cat's-tail comes in upon the fore-castle, and is secured thereon, it must be three-feet sided, as it requires a rabbet of five inches on the aft-side to receive the ends of the deals; but of late years the cat's-tail comes in under the beams, which greatly afflicts the conversion of the cat-heads, and makes more room on the fore-castle, and consequently the beam need be no larger than the others, whereby a great weight is taken off this part of the ship. Between the first and second beam is a ladder-way about three feet in the clear. The third beam is two feet before the centre of the fore-mast; the fore-topfail-sheet-bitts come on the fore-side, and the heels upon the upper deck. The fore-side of the fourth beam is three feet abaft the centre of the fore-mast, which allows for the fore-jeer bitts to come on the fore-side of the beam; and their heels should cast outwards sufficient to lead the fore-tack aft clear of the galley. From the sixth to the eighth beams are the gratings over the galley; on the fore-side of the ninth beam is the scuttle for the fire-hearth funnel; between that and the tenth, the steam-grating over the boiler; and on the after-beams was a cupola, or belfry for the bell, but that of late has been removed to the fore-part of the quarter-deck, between the main-topfail-sheet-bitts, in the royal navy.

The *round-house beams* are smaller than those of the quarter-deck; therefore, let the number of beams on the round-house be two, or more, in number than in the same length of the quarter-deck. The round-house should always have a great round-up, both for strength and convenience.

With regard to placing the round-house beams, we have only to attend to the foremost stantion of the steering-wheel, so as to receive the tenon at the head: the mizen-mast must also have a beam about 20 inches on each side the centre.

SHIP-BUILDING.

centre. Before the mast is a small pair of bitts for the mizen-top-sail-sheets; and over the middle of the captain's lobby is a companion with glass-fathes; but lately illuminators of glass are let into the deck, which are found more convenient. The intermediate beams may be placed equally distant afunder, letting the beam over the screen-bulk-head have a proper round-aft, agreeably to the quarter-deck beam underneath.

The beams of the several decks, as taken from the sheer-plan, *Plate I.*, being described, those of the *orlop* only remain: therefore, fet down from the upper side of the gun-deck beams 7 feet 1 inch, for the upper side of the orlop beams; but as the platforms forward and abaft are laid with three-inch deal or plank, they may be kept so much below the range of the other beams, that is, from forward to beam number fix, and from the twentieth to the after-beam, which is immediately under the twenty-seventh beam of the gun-deck.

The beams of the orlop round-up $2\frac{1}{2}$ or 3 inches in midships, and should be placed directly under those of the gun-deck, except the second beam from forward, which may be equally spaced between the first and third. Between the tenth and the eleventh beams is shewn the capitan-step, &c. for lowering the fore-jeer capitan down on the orlop occasionally; but this has been left off in the navy some years. The fifteenth and sixteenth beams take the well-bulk-heads; and till of late years the well was inclosed by a loover-board bulk-head from the orlop to the gun-deck, but is now only laid over with gratings. Between the twentieth and twenty-first is a hatch to the spirit-room; and between the twenty-second and twenty-third, a hatch to the coal-hole.

Below the orlop are the works in the *hold*: such are the breast-hooks from number one to fix; the step of the fore-mast being made by the fifth and sixth hooks, and framed by carlings. These hooks stand square with the body, but the hooks under the gun-deck and upper deck lay with the sheer of the deck; there is likewise a hook under the hawse-holes. The magazine and light-room extend from the aft-side of the first beam of the orlop to the aft-side of the sixth, which takes the heels of the after-riding-bitts. Next abaft the magazine-bulk-head are store-rooms to the aft-side of the eighth beam; and under those a shot-locker. Close abaft the main-hatchway is the pump-well, inclosed with a bulk-head of three-inch plank, about ten feet fore and aft, and eight feet athwartships in the clear. In the well is the step for the main-mast, and the pumps on each side; and adjoining the well, on the fore and after-sides, are shot-lockers about two feet in the clear. On the fore-side of the twentieth beam is the bulk-head of the spirit-room, which extends to the aft-side of the twenty-second beam; and on the fore-side of the twenty-third beam is the after-bulk-head of the coal-hole, and fore-part of the powder-room, which extends to the after-side of the twenty-fourth or after-beam. The orlop cannot extend further aft, or sufficient space would not be left for the bread-room. On the fore-side of the after-beam of the gun-deck is a bulk-head, which terminates the bread-room; and the space abaft it to the transoms is called lady's-hole. Close before the powder-room-bulk head is a crutch; and two more crutches are spaced abaft the powder-room.

In the profile, *Plate IV.*, is represented the method of connecting the fides and beams together by knees and riders, as used when that plate was engraved; but owing to the great scarcity of knee-timber since that time, other methods of connecting the fides and beams together have been adopted, which will be more noticed hereafter, under the

head of *improvements and projected improvements in the building of ships*. See *SUBSTITUTE*.

Hanging and lodging-knees of wood of a kindly growth is certainly the best mode of connecting the fides and beams together. The addition of breadth and top-riders, particularly in wake of the masts, and three or four in the waist, where they rake much, and so cross several of the timbers, must certainly stiffen the side; but this may be more necessary in repairs than in new ships, if the hanging-knees are of a good growth, as before observed: but by no means to dispense with a hanging-knee to introduce a rider, but only when they can clear each other, as the gun-deck beam fifteen and upper deck beam fourteen, then it may be allowed to be very strong. Observe, whenever a rider comes in the throat of a lodging-knee, it can only be made of iron.

In the *hold* it is customary to place four floor-riders, one under the beam at the aft-side of the fore-hatchway, and the after one under the beam abaft the main-mast; the next under the beam before the main-mast, and the other midway between that and the fore-hatchway. The floor-riders extend about twelve feet on each side beyond the keelson, and about one foot four inches square.

Lower futtock-riders are from five to fix in number, one on the side of each floor-rider, and one or two abaft the after floor-rider. Their length is from the side of the keelson, to give about eight-feet shift to the

Second futtock-riders, which extend from the floor-rider head up to the under side of the orlop-beam, and are about one foot two inches square.

Third futtock-riders are in length from the head of the lower futtock-rider to the under side of the gun-deck beam, and score on to the side of the orlop-beam $1\frac{1}{2}$ inch with a dove-tail, and are in size the same as the second futtock-riders. Observe, in shifting the riders, that they come clear of the pumps and of each other, otherwise they must cast sideways, as at the nineteenth beam of the orlop.

A long carling 14 inches deep and 12 inches broad, is scored up two inches on the under side of the fix after gun-deck beams, or to the beam before the mizen-mast, and connected to the sternson-knee by an iron plate on each side at the after-end, the bolts being driven through and clenched on each plate alternately.

The inboard works being described in profile on the several decks, it is necessary also to represent them on the plan of each deck.

Instructions for designing the Plans of the Decks. Plates V. and VI.

Transfer from the sheer-plan, *Plate I.*, the heights of each deck at the side, at every timber, to its corresponding timber in the body-plan; then upon each plan draw a middle line, and therefrom square up the stations of all the timbers, as taken from the sheer-plan. Next transfer from the body-plan the half-breadth of each timber at the height of the deck intended to be drawn, and set them off on each side the middle line, at its corresponding timber and plan; but in *Plates VI.* and *VI**. half the deck only is represented; then transfer from the sheer-plan, where the deck intersects the aft-side of the stem and stern-post at the rabbet, as in *Plate VI.*, and on those lines set off half the thickness of the stem and stern-post. A curve drawn through the half-breadths as set off, ending in the rabbet afore and abaft, will represent the outside of the timbers; then within that line set off the moulding of the timbers, and drawing another curve thereto, gives the boundary of the deck at the side, and determines the length of the beams.

Upon

SHIP-BUILDING.

Upon each plan square down the sides of the ports and beams, and centres of the masts and capstans, from the profile, *Plate IV.*

Thus far the plans of the decks are general; but as each deck is very differently fitted, it is necessary to have a half-plan of all at least, and what little difference there may be on the opposite side, let the explanation suffice.

In the plan of gun-deck, *Plate V.*, is shewn not only the upper sides of all the beams, and the method of tabling them together in two or more pieces, as then customary, but now douelled instead of tabled; those in midships, being the longest, are made of three pieces; and those where they are shorter, as at the twenty-sixth beam, are in two pieces: those in three pieces have the middle piece scarfed to each arm. The method of connecting the sides with langing and lodging-knees is likewise shewn in this plan, with the iron lodging-knee behind the rider, (engraved hanging by mistake,) as at the fifteenth and sixteenth beams. The beam-arms at the main-hatchway and mast-rooms are represented as tabled into their adjoining beams, the seventeenth and eighteenth. The framing of the deck to receive the flat having three tier of carlings, nearly all fore and aft, with a sufficient number of ledges let into them parallel with the sides of the beams, is also represented here. The framings in the middle are the mast-partners; those for the fore-masts to be formed by the standard against the fore-side of the fore riding-bitts, the inside of which must be kept half the diameter of the mast, and five inches more for the wedging, and to extend from the bitts to the step of the bowsprit: the cross-chocks, which frame the mast-hole athwartships, are to be eight inches thick, and kept at the same distance on each side the centre of the mast, and rabbet into the partners: the mast-hole is made eight square, but now circular, by corner-pieces rabbetted to half their thickness into the partners and cross-chocks: on the fore-side of the fifth beam is a cap-scuttle about two feet square, and another abaft the sixth beam for handing up cartridges, &c. from the magazine. The fore riding-bitts are 1 foot 8 inches square, and placed four feet asunder, or two feet on each side the middle line: the after riding-bitts are of the same size, and placed 4 feet 6 inches asunder, and the standard against their fore-sides extends to the fore riding-bitts: the cross-pieces abaft the riding-bitts are 1 foot 6 inches fore and aft, and two inches less deep, and the face-pieces on their aft-sides are of elm six inches thick. The framing of the fore-hatchway and ladder-way consists of coamings 1 foot 6 inches above the beam, that is, the lower piece to be 9 inches deep and 10 inches thick, and the upper piece 9 inches deep and 7 inches thick, douelled together, and spread in the clear 4 feet 8 inches; and the head-ledges to be 7 inches thick, scored and tailed into the coamings, and to round-up above the latter, after the rate of $2\frac{1}{2}$ inches in six feet of length. The capstan-partners are here framed as on the upper deck; but as this method of lowering the fore-jeer capstan is discontinued, let it be framed as the main-jeer capstan. The main-mast partners are framed similar to the fore partners, the carling being 1 foot 5 inches broad, and 1 foot 6 inches deep. The chain-pumps are represented on the plan as fitting the pump-cafes through the mast-partners, and the back-cafes without; the sprocket-wheel and spindle-work in brads rhodings or gudgeons, let into the top-sail-sheet and jeer-bitts, and the winches also in the pump-pillars. The main-hatchway is 6 feet 4 inches athwartships, and fitted with coamings and head-ledges as the fore-hatchway. The after-hatchway is the same as the fore-hatchway. The step for the main-jeer capstan is 1 foot 10 inches broad, and 1 foot 6 inches deep, to be scored down between beams 21 and 22, and lap thereon 8 inches above the beam, with

broad carlings on each side to receive the bolts of the pall-rim: in the middle of the step is an iron cap to receive the spindle. The hatch to the spirit-room, and ladder-way to the cock-pit, are framed as the fore-hatchway. The mizen step to be 1 foot 8 inches broad, and 1 foot 4 inches deep, and scored down between beams 25, 26, and 27, two inches. The bread-room scuttle, which is 2 feet 4 inches square, is on the larboard-side, and is framed with coamings and head-ledges, with a cap or top as high above the deck as at the hatchways: on the starboard-side abaft is a scuttle about two feet square over lady's-hole, and another 14 inches square over the scuttle to the magazine. On the gun-deck, in the middle of the three or four after-beams, is a standard, sided 12 inches, the upper end to lay against the transoms, as high as the helm-port transom.

A strake without the coamings at the main-hatch is represented, the binding-strakes all fore and aft, which are to strengthen the decks, as they are weakened by the hatchways, therefore the butts should be shifted clear of them: in the inner strake are driven the stopper-bolts. Forward is shewn the moulded size of the deck-hook and eaking, also the plan of the hawse-holes and manger, with the stantions.

On the same plate is drawn the plan of the orlop, with its several conveniences. On the fore-platform, which extends from the fore-peek to the fore-hatchway, is the boatwain's cabin on the larboard-side, with such another for the carpenter directly opposite; and before each is a store-room, to hold their respective stores; before the boatwain's store-room is a sail-room: between the fore riding-bitts are two doors, one leading to the light-room passage on the larboard-side, and that on the starboard-side to the magazine and gunner's store-room. Close before the heel of the larboard foremost riding-bitts is a cap-scuttle, inclosed, to hand up filled cartridges; and on the opposite side a flat scuttle to the magazine, likewise inclosed: at the end of the light-room passage is a scuttle to the light-room: abaft the riding-bitts are scuttles to the boatwain's, gunner's, and carpenter's store-rooms under the orlop. The fore-hatchway is of the same size, and immediately under that on the gun-deck, but has only a flat framing round it, to take the hatches that cover it. The beams of the orlop are rabbetted on each edge to receive the flat, which is only oak boards $1\frac{1}{2}$ inch thick as far as the after-platform. The midship sail-room now extends from the main-hatchway to the fore-hatchway, and is framed round with pillars upon a carling ten inches deep; and as the capstan-room is not used, the gunner's cabin is made at the fore-part. The main-hatchway is of the same size as that over it, and is framed round as the fore-hatchway. The well is not inclosed, as shewn on the plan, but at present is laid over with gratings. The after-hatchway is of the same size as the hatch over it, and framed like the others. Between the beams 21 and 22 is a double hatch to the spirit-room, and one next abaft it to the coal-hole. On the fore-side of beam 23 is the bulk-head of the cock-pit, and abaft it inclosed are two scuttles, one to the powder-room the other to the light-room.

On the larboard-side abaft is the steward's room, abaft which is the bread-room; and the interval between the steward's room and light-room bulk-head is the steward's bed-place and racks for stowing cheefe: next before the steward's room is the purser's cabin, before that the slop-room, and next to that a compartment for the marines' clothing. From the steward's room, to nearly forward on each side, are the wings, or an open space about 4 feet 6 inches from the side, sufficient to swing a mall, if necessary, to plug up shot-holes in the time of action. From the steward's room to the marines' clothing

SHIP-BUILDING.

is birthed up with a bulk-head of $1\frac{1}{2}$ -inch deal, and the same from the boatwain's cabin forward, and between those with stantions and whole deal battens or lattice-work. On the starboard-side, opposite to the steward's room, &c. is the captain's store-room, doctor's cabin, and first lieutenant's store-room; and between the captain's store-room and passage to powder-room, is fitted a dispensary for the doctor.

On this plan it is customary with a different coloured ink to draw the plan of the works in the hold; and to distinguish them on the plate, they are represented by fine ticked lines.

Under beam 1 is a bulk-head for the boundary of the light-room, together with its plan, and also the magazine-lights, jambs, and splan-boards, (to throw the rays of light more into the magazine). The magazine is surrounded by a strong bulk-head of three-inch plank, the edges rabbetted together, the inside of which is doubly lined with slit deal, so as to cover each joint, and on the outside with slit deal, and a thick coat of mortar under it. The flat of the magazine is first laid with three-inch plank, caulked on beams underneath, upon which are fastened, with copper dumps, the pallating beams, framed together at right angles, about three feet asunder: the upper edges are rabbetted to receive the flat, which is $1\frac{1}{2}$ -inch deal, lined on the under side. The bulk head at the side, which forms the wing, is constructed with pannels, and rabbetted stantions to receive the pannels: in the fore part of the magazine in midships is the filling-room, which is lower than the surface of the flat about twelve inches: this is lined with lead, as it is the place where the cartridges are filled, (hence its name,) for greater security: as it is close abaft the lights, glass sashes extend across, guarded with a copper-wire net-work: in the sides of the filling-room are racks for filled cartridges, and a compartment behind them for staves of empty barrels. The powder-barrels are stowed upon dunnage battens, over the pallating flat, which is parted off from the filling by an open bulk-head of stantions and battens. Magazines are now only fitted up to receive barrels with cartridges already filled.

Abaft the magazine are a store-room for the boatwain; on the larboard-side, in midships, a store-room for the gunner, and under that a shot-locker; and on the starboard-side a store-room for the carpenter.

Next abaft the main-hatchway is the plan of the well, and shot-locker afore and abaft it. Under the fore-side of the 20th beam is the bulk-head of the spirit-room, and under the aft-side of the 22d beam the bulk-head of the coal-hole: its after bulk-head is under the fore-side of the 23d beam, which also makes the fore bulk-head of the powder-room, which is inclosed round with a bulk-head similar to that of the magazine forward; likewise the light-room, and passage to the powder-room, which is fitted up with racks for stowing filled cartridges, as represented in the plan: all abaft the powder-room bulk-head is occupied for the bread-room, to the bulk-head for lady's-hole.

On *Plate VI.* is represented the half-plan of the quarter-deck, waist, and forecastle, likewise the half-plan of the upper deck.

On the plan of the upper deck is shewn the beak-head stantions, whose sides are rabbetted to receive the bulk-head: the midship stantions to be about 2 feet 6 inches on each side the middle line, and 12 inches square as high as the flat of the beak-head; they tenon at the heel into the foremost beam of the upper deck, and receive into their outsidings the tenon of the collar-carling, which is of the same size as the stantions, having its upper side well with the flat of the beak-head, which is of the same height as the lower fills of the ports. The midship stantions to be $6\frac{1}{2}$ inches square above the

collar-carling: the other stantions, which are four in number on each side, are all $6\frac{1}{2}$ inches square, and face aft $\frac{2}{3}$ ths of an inch into the cat-beam: the two outer stantions are placed asunder to the spread of the round-houses, and should be kept far enough out that the funnel may come clear of the side: the third stantion from the middle line must be spaced so as to make the bow-chafe port: the next stantion within makes the head-door: on the midship-side of the head-door is a scuttle, with a flap hung over it to lead in the fore-tack. The heels of all these stantions tenon into the collar-carling with a double-stop.

The framing of the fore-mast partners are shewn, as before directed, for the main partners on the gun-deck, on the outside of which are the heels of the fore-sheet and jeer-bitts; the heel of the former to spread sufficiently from the middle line to lead the fore-tack clear of the galley, having a sheeve fitted into it for that purpose. Abaft the fore-mast partners are the cants for the galley, which is inclosed abaft by two doors.

The fore-hatch and ladder-way to be framed, as directed on the gun-deck, with coamings ten inches broad, and nine inches above the deck, and head-ledges six inches thick; next abaft are the fore-jeer capitan partners, to be seven inches thick, their ends led down into a framing similar to the hatchway (or to have their ends square, and flut in with the deck), and bolted through the beams and carlings, and their edges to be rabbetted to stop the caulking. The ladder-way, main hatchway, main-mast partners, after-hatch, main-jeer capitan partners, gratings, and ladder-ways, are all framed as before described.

On this plan the flat of the deck is represented, and the several butts shifted: close to the side are the water-ways, five inches thick, and the first strake of oak, which is cut off between the riders; the next four strakes are also English oak in the wear of the guns, shifted in short lengths, and anchor-stock, or top and butt, to assist the conversion. The rest of the deck is three-inch Prussia deal, except the binding-strakes, which are the second and third, without the main hatch-coamings, and under the forecastle: the deals must be so shifted as to work their whole lengths, or great waste will occur, that is, 30, 36, and 40-foot lengths. The mizen partners are framed with a carling on each side, and corner-pieces as high as the beams, and the flat round them is oak, five inches thick.

Close up under the beams is represented the tiller, as fitted with the horn-hoop over the end, for keeping up the tiller-rope in the sweep, and a hoop abaft it, with eyes in it, through which the rope is reeved, to be set up taught by tackles hooked to the eye-bolts; further aft, at the after-end, are iron rods, which are hove taught by a screw-nut, to keep the tiller aft. At the fore-end, on the upper side, is an iron gooseneck, which traverses on the sweep, and keeps up the fore-end; the rope traverses round the sweep in a groove, and is led up to the wheel on the deck above by sheeves fitted at the end of the sweep, and the blocks afore the mast represented by the ticked line.

Sometimes abaft, where the side is to round to have riders, iron standards are fitted, as on beams 26 and 27.

On the beam, before the mizen-mast, is the bulk-head of the ward-room, fitted with double doors on each side.

The knee under the cat-beam prevents the hanging of a door at the aft-side of the round-houses forward: they are therefore inclosed with a bulk-head, and a door on the aft-side.

On the plan of the forecastle is shewn (as was the practice when the plate was engraved), the construction of the life-rail, as let over the heads of the beak-head-stantions,

SHIP-BUILDING.

with the chafe-port and upper part of the round-houses; also the plan of the cat-head, cat's-tail, and the knee abaft the cat-head. Between the cat's-tail and the fore-mast is framed in midships a ladder-way, and round the fore-mast are the fore-top-fail-sheet and jeer-bitts, with their cross-pieces; on the sides of the bitts the cheek-blocks, or they must be provided very large, to receive all the sheeves necessary for sheets, braces, &c. Abaft the fore-mast, on each side, is a scuttle for the top-tackles to lead through to hook to an eye-bolt on the upper deck. Over the galley, in midships, are framed the steam-gratings; and between them coamings for the chimney-funnel. At the aft-part of the fore-castle are represented the belfry bitts, with the knees to support them; and over the breast-beam are shewn the foot-rail and stantions, as then used, but now discontinued.

Along the waist into the side, instead of gang-boards, as formerly, the deck is continued from forward to aft seven feet three inches from the side; likewise the flat is continued along the midships, five feet three inches on each side the middle line, except an opening over the main-hatchway.

Upon the plan of the quarter-deck is shewn the plan of the breast and foot-rail over the breast-beam, with their stantions, now rendered unnecessary by continuing so much of the deck along. On each side of the main-mast is a flat scuttle for the pumps to be passed through; and on the aft-side of the beam abaft the mast are the brace-bitts. Abaft the brace-bitts, on each side, is a flat scuttle, for leading through the main top-tackles to an eye-bolt driven in the upper deck. From the seventh beam to the twelfth the space is framed for gratings, and a ladder-way, as before directed, five feet four inches in the clear. Between the fourteenth and fifteenth beams are fixed the steering-wheel and its stantions; in the next opening is the mizen-mast: the partners are formed with thick-stuff, as at the upper deck. On the beam abaft the mast is the bulk-head of the lobby and bed-place; and on the twenty-first beam the bulk-head of the captain's cabin: between these bulk-heads are a fore and aft bulk-head that part the lobby and bed-place; and on the twenty-fourth beam is the screen-bulk-head. The latter is unnecessary when there is no walk or balcony abaft.

A plan of the round-house is not wanted, as, besides its beams and ports, there are only the mizen-top-fail-sheet-bitts on the fore-side of the beam before the mast; and taffrail-knees abaft: when an open stern, illuminators instead of a companion are let into the deck.

Explanation of the Methods of Laying-off all the Parts of a Ship on the Mould-loft Floor, preparatory to the actual Building of the Ship.

The sheer-draught, *Plate I.*, being completely drawn upon paper, mostly to a scale of a quarter of an inch to a foot, as before observed, or forty-eight times less than the real size of the ship, it remains to expand it to that size on the mould-loft-floor; but the latter is seldom long enough to admit the laying-off of any large vessel in one length; in small mould-lofts they must of course lay-off in three or four lengths. Indeed, to lay-off in one length would cause unnecessary waste of time; for many of the joints of the timbers, or perpendiculars of the fore-body, answer alike for the after-body.

Laying-off. Plate VII.

Plate A may be said to represent the mould-loft-floor in miniature, by the same scale as *Plate I.*; but here, to prevent confusion, the different plans are shewn separate, but

on the floor in the grofs: the several plans are laid off one over the other, which, to the practitioner, is perfectly clear.

The mould-loft-floor being cleared, begin by striking a straight line from one end to the other, as *AA* in the above plate, in distance from the side of the loft as much as the keel is deep. This line will represent the upper edge of the rabbet of the keel in the sheer-plan, *fig. 1*, above which all the heights are to be set up, and it will represent also the middle line of the half-breadth plan, *fig. 2*.

Proceed now to lay-off the fore-body, by transferring from the sheer-plan, *Plate I.*, and erecting from the line *AA*, to the right-hand, the several perpendiculars or joints of the frames \oplus , *B*, *D*, *F*, *H*, *K*, *M*, *O*, *Q*, *S*, *U*, *X*; and the foremost-perpendicular, and likewise frames 2 and 4 abaft \oplus . This must be accurately done, so as not to exceed the room and space.

Now describe the stem, as in *Plate VII. fig. 1*, supposing it of the full size, by setting up from the line *AA* the height of the centres from *Plate I.*, and the nearest distance thereon from the adjoining perpendicular, as at *Q*, *Q*; by which radius the fore and after sides are swept, likewise the rabbet in the middle, from the keel upwards to *S*. Then set up the height of the head, or upper part, and its distance forward from the nearest perpendicular; then, by pinning a batten to the spots last set off, and to the curves already swept, the stem will be formed likewise.

Transfer from the sheer-plan, *Plate I.*, the heights of the lower and upper height of breadth-lines from the line *AA*, as in *Plate VII.*, from the perpendicular 4 to the stem; then, by pinning a batten to those heights, produce the fair curves *E* and *F*.

Let the outlines of the fore body-plan, *Plate VII. fig. 3*, be represented, that is to say, the middle line by the line *AA*; the base line, or upper edge of the keel, by one of the perpendiculars; then will the outside line, *RL*, be parallel to the line *AA*: at the moulded breadth at dead-flat (as few mould-lofts are broad enough to admit the height of the timbers as in the plate,) strike in the half-siding of the stem *S* from the middle line.

The main half-breadth line may now be laid off, by transferring it from the half-breadth plan, *Plate I.*, to its corresponding timbers on the floor, from the line *AA*; and to end this line at the stem, take the height in the sheer-plan, *fig. 1*, where the lower height of breadth-line intersects the aft-side of the rabbet of the stem, and transfer it to the middle line of the body-plan, *fig. 3*; and from thence take the half-thickness of the stem, and set it up from the middle line of the half-breadth plan upon a line squared down from the aft-side of the rabbet of the stem, at the lower height of breadth in the sheer-plan. Then, by pinning a batten to the several half-breadths set off, and to its ending at the stem, we form the fair curve *D*, as in *Plate VII. fig. 2*, or main half-breadth line.

Observe, when the batten is pinned, to look along it strictly, and see that its edge produces a fair line: this must be always understood, and therefore need not be repeated.

Transfer from the sheer-plan, *Plate I.*, the heights of the centres for the radius of the floor-sweeps of the fore-body on to the floor, and by pinning a batten thereto, produce the line *B*, in *fig. 1*.

Transfer from the half-breadth plan, *Plate I.*, the rising half-breadth, or narrowing of the floor-sweeps of the fore-body, and by pinning a batten thereto, produce the line *B*, in *fig. 2*.

Transfer from the sheer-plan, *Plate I.*, the heights of the top timber-line to the floor; and should the floor not be broad enough to admit the whole heights, set them up their

SHIP-BUILDING.

their respective timbers from some straight line, as A A, allowing the addition of twenty feet; then, by pinning a batten to those heights set up, produce the curve I, *Plate VII. fig. 1.*

Transfer from the half-breadth plan, *Plate I.*, the top-timber half-breadth on to the floor, and by pinning a batten to the several half-breadths set off, the curve C, in *Plate VII. fig. 2*, will also be represented.

Then, having marked the several lines laid off with their respective names, proceed to lay-off the fore-body, fixing on some convenient part of the floor, making the line A A, *Plate VII. fig. 1*, serve for the middle line M, *Plate VII. fig. 3*, and one of the perpendiculars for the base line, or upper edge of the keel, as before observed. The diagonal lines in the body-plan are not only used in laying-off the body on the floor, and taking the bevellings of the several timbers, but are of very principal use in the actual building; for at their stations the ribbands and harpins, which keep the whole frame of the ship together until the planking is brought on, their situation with regard to the heads of the timbers must be determined; it consequently follows, that a particular explanation of them is necessary.

The floor-head diagonal marked C in *Plate VII. figs. 3* and *5*, terminates the length of the floors, hence its name. The placing of this diagonal is of the utmost consequence to the strength of the ship, it being so near the bidge, or that part which takes the ground, that it consequently is always liable to the greatest strain. It should, therefore, be placed as much above the bearing of the body in midships as can be conveniently allowed by conversion of the timber; but, afore and abaft, it is not of so much consequence. Bevellings are taken at this diagonal to as far forward and aft as the floor extends.

The diagonal marked B in *Plate VII. figs. 3* and *5*, is placed in midships from eighteen inches to two feet, according to the size of the ship, below the floor-head C; it is the station where the floor-ribband is placed in midships, and likewise the floor-harpin forward. Bevellings are also taken at this diagonal, all fore and aft, from which it is termed the *floor-ribband*.

The lower diagonal, marked A in *Plate VII. figs. 3* and *5*, is situated generally in the middle between the keel and floor-ribband; at which place the lowest bevellings of the timbers are taken.

The diagonal marked D in *Plate VII. figs. 3* and *5*, is situated in the middle, between the floor-head and first futtock-head, at which place a ribband and harpin are necessary for the security of the first or lower futtocks, and hence called the *first futtock-ribband*. There are also bevellings taken at this diagonal, all fore and aft; which, being the part of the body where the timbers most vary, occasion them to be the greatest bevellings in the whole body.

The diagonal marked E in *Plate VII. figs. 3* and *5*, terminates the heads of the first futtocks, and is therefore called the *first futtock-head*: it should be spaced about seven feet above the floor-head, in order to give sufficient scarf or shift to the lower part of the second futtocks. Bevellings are likewise taken at this diagonal, all fore and aft.

The diagonal marked F in *Plate VII. figs. 3* and *5*, is situated in the middle, between the first futtock-head and the second futtock-head, at which place a ribband and harpin are necessary for the security of the second futtocks, and hence called the *second futtock-ribband*. Bevellings are also taken at this diagonal, all fore and aft.

The diagonal marked G in *Plate VII. figs. 3* and *5*, terminates the heads of the second futtocks, also the heads

of the double futtocks afore and abaft the floors, and is therefore called the *second futtock-head*; it should be spaced about seven feet above the first or lower futtock-head, in order to give sufficient scarf or shift to the lower part of the third futtocks. Bevellings are also taken at this diagonal, all fore and aft.

The diagonal marked H in *Plate VII. figs. 3* and *5*, is situated in midships in the middle, between the second futtock-head and the third futtock-head, at which place a ribband and harpin are necessary for the security of the third futtocks, and hence called the *third futtock-ribband*. Observe, the harpin is placed low enough at the stem that the wales may be worked before it is taken down, or it may fly up like the others, and not come home to the stem. Bevellings are also taken at this diagonal, all fore and aft.

The diagonal marked I in *Plate VII. figs. 3* and *5*, terminates the heads of the third futtocks, and is therefore called the *third futtock-head*, and should be spaced about seven feet above the second futtock-head, so as to give the same shift to the fourth futtocks as the other futtocks have. Observe, such third futtocks as come under the gun-deck ports, must be continued upwards to the under part of the ports, if possible to be gotten. Bevellings are also taken at this diagonal, fore and aft.

It must be observed, that the diagonals for the ribbands, as above described, must all be drawn in pencil on the body-plan, *Plate I.*

A ribband and harpin are also placed all fore and aft below the gun-deck and upper deck ports, and one likewise at the top timber-line, as at M, N, and O, *Plate VII. figs. 3* and *5*, which, with the ribbands and harpins before mentioned, keep the whole framing of the ship together to its true model.

Having described the diagonals, and struck them across the fore-body on the floor, as in *Plate VII. fig. 3*, the several timbers may be completed, by first transferring the lower height of breadth-line E from the sheer-plan, *Plate VII. fig. 1*, from \oplus to X, to the fore body-plan, *fig. 3*, and striking horizontal lines at each of those heights across the body-plan, as at K; then transfer the main half-breadth of each timber from the half-breadth plan, *fig. 2*, upon their corresponding heights from the middle line of the body-plan, *fig. 3*. Then by taking the radius or length of the lower breadth sweep from the fore body-plan, *Plate I.*, of timber dead-flat, set it off upon its lower height of breadth line, and it will sweep it downwards nearly as low as the second futtock-head: in the same manner proceed with all the timbers to Y.

Take off the half-breadths of each timber in the fore body-plan, *Plate I.*, from the middle line on the diagonal floor-ribband, as far forward as X, and set them up from the middle line of the half-breadth plan, *fig. 2*, upon their respective timbers; then, to end it at the stem, transfer the height where it intersects the half-thickness of the stem in the body-plan, *fig. 3*, to the fore part of the rabbet of the stem in the sheer-plan, *fig. 1*; from thence square it down to the middle line of the half-breadth plan, *fig. 2*. Take the half-thickness of the stem in the body-plan, *fig. 3*, on the diagonal, and set it up from the middle line of the half-breadth plan, *fig. 2*, upon the line last squared down; and from thence sweep an arc the thickness of the bottom plank taken on the diagonal, the after part of which arc is the ending of the fore part of the floor-ribbands. Then, by pinning a batten to the several half-breadths, and to the back of the arc or ending, the floor-ribband will be laid off.

In the same manner proceed with the ribbands or diagonals

SHIP-BUILDING.

D, F, and H, *fig. 3*, as you find ticked from \oplus to the stem in the half-breadth plan, *fig. 2*, to their respective diagonals in the body-plan, *fig. 3*.

Set up 11 feet from the base line in the body-plan, *figs. 3* and 5, and strike a line parallel thereto, which is the height of the centre of the floor-sweep at dead-flat. Then take the heights in the sheer-plan, *fig. 1*, for the centre of the floor-sweeps B, from B to K, and set them up in the body-plan, *fig. 3*, above the centre at dead-flat, and at each height strike level lines. Then take the half-breadths in the half-breadth plan, *fig. 2*, of the centres of the floor-sweeps B, and set them off on their corresponding heights from the middle line in the fore body-plan, *fig. 3*. Then, with a radius at the centre in the body-plan, to its corresponding half-breadth on the diagonal floor-ribband, sweep the curves of the several timbers at the floor-head, from \oplus to K.

Having swept in the various curves below the lower height of breadth, and at the floor-heads, pin a batten to the half-breadths, as set off on the diagonals for dead-flat, and the back of the above sweeps; continue it with a small curve or hollow from the sweep at the floor-head to the rabbet of the keel, which completes that timber from the lower height of breadth to the keel. The same process will complete all the timbers. With regard to the heeling of the timbers exactly, set off the half-thickness of the keel from the middle line in the body-plan, *fig. 3*, on the base line, and parallel thereto to its depth; then with compasses, opened to the thickness of the bottom plank, sweep two arcs, so as to form the triangle at the outside on the upper edge, and it will be readily seen that the timbers along the midships will end at the outside of the rabbet; but as they approach forward, they will end on the inside of the rabbet; and as the keel tapers at the fore-end, they must be heeled sufficiently within the keel to admit the thickness of the plank: then to heel the timbers that rise on the stem, transfer their heights where they cut the outside of the rabbet of the stem in the sheer-plan, *fig. 1*, to the half-thickness of the stem in the body-plan, *fig. 3*; from thence, with compasses opened to the thickness of the bottom plank, sweep an arc inwards, the back of which is the ending of the timber, and a line squared from the timber to the height set off on the outside of the stem represents the rabbet in that direction.

The fore-body being completed below the lower height of breadth, the upper part, or top-side, may be laid off by transferring the upper height of breadth line F from the sheer-plan, *fig. 1*, at each timber from dead-flat to X, to the body-plan, *fig. 3*, and striking level lines across at each height. Continue upwards each timber parallel to the middle line, from the lower to the upper height of breadth. Then, with the radius of the upper-breadth sweep taken from the body-plan, *Plate I.*, sweep upwards every timber from its respective upper-breadth line, from dead-flat to O.

Transfer the height of the top timber-line I, from the sheer-plan, *fig. 1*, at every timber, to the fore body-plan, *fig. 3*, and strike in level lines at every height; then take the top-timber half-breadth from the half-breadth plan, *fig. 2*, at every timber, from dead-flat to X, and set them off from the middle line of the body-plan, *fig. 3*, upon their respective heights. Then, by a mould made to the hollow or tumbling-home of the top side, and upper-breadth sweep at dead-flat, and a few feet above the top-timber-line, every timber from dead flat to O may be formed on the floor by lowering or raising the mould so as to agree with the upper-breadth sweep, and the half-breadth, as set off on the top timber-line. But the timbers before O must gradually par-

take of the hollow of top-timber X, which falls outwards considerably from a perpendicular at its main-breadth, though parallel to the middle line above the height of the top timber-line to the top of the side, which must be transferred from the sheer-plan, *fig. 1*, to each timber respectively in the body-plan, *Plate VII. fig. 3*. Pin a batten to those several heights, which will form the curves O and P, as in *fig. 3*. Take square from the middle line in the body-plan, *fig. 3*, the half-breadths of all the timbers at the top of the side, and set them up on their corresponding timbers from the middle line in the half-breadth plan, *fig. 2*; seeing that it makes a fair curve. The fore-body may now be laid to be laid off above the main-breadth, which completes the whole of the square fore-body, *fig. 3*.

The correct height of the knuckles of the timbers at the beak-head requires some attention; for if they were carried too high, the sheer of the ship must be lifted; or, if kept too low for the sheer, the timbers must be reduced to raise the knuckles: therefore determine what part of the sheer-strakes shall come well with the knuckles; for if the knuckle was to come in the middle of either sheer-strake, the fore-shift of it must then be wrought, taking a large piece of timber and much labour. In *Plate VII.* the upper edge of the sheer-strake is well with the knuckle. Another consideration to be taken into this account is the lifting the sheer forward, that it may have the same appearance on the ship as is designed on the draught; for if not lifted gradually some inches higher towards the stem, the curvature of the bow will make it appear to drop below a fair curve.

To know how much the sheer of the ship requires to be lifted forward has sometimes been resolved in this manner. Prolong the sheer of the wale before the stem in the sheer-plan, *fig. 1*, at pleasure; then pin a batten to the round of the bow at the main half-breadth, in the half-breadth-plan, *fig. 2*, and mark on the batten the stations of the square timbers and the side of the stem; then pin the batten to the sheer of the wale in *fig. 1*, keeping the stations of the timbers, as marked on the batten, well with those near dead-flat, where they will not alter; then mark the other timbers, and the stem on the sheer of the wale-line prolonged, and level them aft, to intersect their corresponding timbers and the stem; then a batten pinned to those intersections will give the curve for lifting the sheer of the ships round the bow. But as the forms of the bows of ships are so very different, it cannot be recommended as an undeviating rule, and therefore must be referred to practice; however, it is requisite to make an allowance for it in the laying-off of all ships, as the decks, sheer-strakes, and consequently the knuckles of the timbers, all partake of this necessary additional height.

The square body afore dead-flat being now laid-off, proceed to lay-off the after-body abaft dead-flat: but it is only necessary to point out such differences as occur at the extremes of the ship, the midship part being similar in both bodies.

On the mould-loft-floor it is customary to set off as many of the perpendiculars abaft the fore-body already laid off, as to have sufficient room for the stern-post, using as many of those in the fore-body as will answer to the regular room and space of the timbers, which will be as far as B, which will extend in the after-body as far as 14, consequently from 14 strike up from the line A A all the remaining perpendiculars to 36.

Strike in the aft-side of the stern-post on the floor from the sheer-plan, *Plate I.*, and the aft-side of the rabbet; and strike a line parallel thereto, on the fore-side, to the thickness of the bottom plank.

SHIP-BUILDING.

Transfer from the sheer-plan, *Plate I.*, the heights of the centres of the floor-sweeps, lower and upper heights of breadth, top timber-line, and top of the side, as before.

Transfer from the half-breadth plan, *Plate I.*, the half-breadths of the floor-sweeps, main half-breadth, and top-timber half-breadths. But to end the main-breadth, and likewise the top-timber half-breadth in the half-breadth plan, *fig. 2*, the side-counter-timbers must be laid off in the sheer-plan and body-plan, and where they intersect the side-counter-timber in the sheer-plan, must be squared down to the half-breadth plan.

In the plan of the after-body on the mould-loft-floor, its middle line is made by the side-line of the fore-body, consequently the bodies at the lower part cross each other. This would have appeared very confused in the plate, but it is always a maxim in laying-off on the floor to use as few lines as possible.

The lower height of breadth and sweeps, and the centres of the floor-sweeps in the after-body, *fig. 5*, may all be obtained exactly in the same manner as directed for the fore-body. The diagonals struck in, and the several half-breadths of the timbers set off thereon, form the after body-plan, *Plate I.* Those timbers which come near the after-end of the keel, must be ended by setting off the half-thickness of the keel, as far as it tapers from the stern-post in the half-breadth plan, *fig. 2*; and within the half-thickness of the keel, set off the thickness of the bottom plank. Then take off the half-breadth of each timber to the inside of the rabbet, and set it off on the base line from the middle line of the body-plan, *fig. 5*, which is the true ending of every timber at the upper edge of the keel.

The top-side of the after-body, *fig. 5*, is laid off in the same manner as directed for the fore-body at dead-flat, even to the after-timber.

When the bodies are thus far laid off on the floor, it is usual to make the moulds, and take the bevellings of all the timbers in the square body; that is, from O forward to 28 abaft.

Moulds for the Timbers in the Square Body.

The moulds for the midship floors are generally made first in the following manner: take fir-board, about three-quarters of an inch thick, and lay the outer edge to the floor-timber dead-flat, in the body-plan, *fig. 3*, from the keel to the floor-head, and make it of a parallel width, about four inches. Provide another board, and lay it to the foremost square floor O, from the head to the sides of the keel, and make it of the same width. Then tack them both down in their places, and nail a piece of board made parallel to the half-breadth of the keel, its midship edge well with the middle line, and lower end cut square, and be well with the base line, or upper edge of the keel: the upper end is to extend a few inches above the cutting-down of O. Now nail a straight batten, about four inches wide, at the floor-head, from dead-flat to O; the upper edge well with the direction of the floor-head C. Let battens of the same width be nailed across, with their upper edges kept well with the floor-ribband B, and one at the lower diagonal A, and as many between as may be thought necessary. Let these battens be one inch narrower than the others, which will distinguish them, as the former shew the proper stations of the diagonals, and likewise the direction of the floor-heads. Then, upon the cross battens must be marked the intermediate floors from dead-flat to O. There must be outside pieces and battens put together, exactly in the same manner, for the other side; and the lines for the moulding edges of the floors correctly transferred to the other side.

These two moulds may then be united together at the middle line by hinges, so as to shut together, and be more handy for use.

The cutting-down line being transferred from the sheer-plan, *fig. 1*, to the floor, as at M, *Plate VII. fig. 1*, take its height above the upper edge of the keel at every floor from dead-flat to O, and set them up the middle line of the mould from its lower edge, and square them across, marking each floor's name respectively. Fix one or two battens horizontally across, from the cutting-down board in the middle to the foremost floor, as braces, to preserve the mould from racking. The mould is now finished for moulding the floors of the fore-body thus far.

Now lay the blank side of the mould upwards in the after-body, *fig. 5*, and mark thereon, as before, the moulding edges of as many of the after-floors from dead-flat as the mould will contain, and the heights of their cutting-down, which will be found to extend to 21.

Then to the floors from 22 to the after-square floor 28, another similar mould must be made.

The lower futtock-moulds are best made of seasoned board of the above thickness, the outer edge being fayed to the frame-futtock, and the inside edge to the adjoining filling, from a few inches within the side of the keel to the first futtock-head. Then when the mould is in its place, mark thereon the side of the keel, lower diagonal A, floor-ribband B, first futtock-ribband D, and first futtock-head E; or a shorter way, the diagonals numerically, 1st diag. 2d diag. &c.

But if saving of stuff and time be considered as an object, make the edges of the mould lay to the two adjoining frames, and set down splines to the corresponding fillings at every diagonal, and also at the head and heel.

The second futtock-moulds may be next made similar to the above, from the floor-head to the second futtock-head, marking thereon the heel C, first futtock-ribband D, first futtock-head E, second futtock-ribband F, and second futtock-head G.

The third futtock-moulds may be next made in the same manner from the first futtock-head to the second futtock-head, marking thereon the heel E, second futtock-ribband F, second futtock-head G, third futtock-ribband H, and third futtock-head I.

The fourth futtock-moulds differing in their shape, and being much longer than the others, the best and readiest method is to lay this mould to dead-flat, from the second futtock-head to the top of the side, and two or three feet longer, as the heads run higher afore and abaft dead-flat. The inside of the mould towards the upper part may be made to the scantling line, but at the heel, and a few feet above it, should be made as broad as possible; so that by this one mould may be moulded nearly all the fourth futtocks in the fore-body. Lay the mould in its place at dead-flat, and mark thereon the heel G, third futtock-ribband H, third futtock-head I, lower and upper heights of breadths K and L, gun-deck port-fill M, upper deck port-fill N, top timber-line O, and top-side P.

Next place the upper part of this mould to the foremost fourth futtock, O, of the square body, and it will be found to lay from the main-breadth upwards (as it will likewise lay to all the timbers between O and dead-flat, in consequence of the radii of the upper-breadth sweeps being all of one length); then, while the mould is in this position, if it covers that part of the timber from the main-breadth downwards to the fourth futtock-heel, the fourth futtock of this timber may be moulded by this mould, as it may then be consequently marked on it; but if not, then the mould

must

must be moved to the next timbers aft, placing it after the same manner, until the timber is found to which it will mould, as described above: while the mould lies well to the timber above the breadth, take its corresponding third futtock-mould, keeping the heel of the third futtock-mould well with the heel of its timber, then rase or mark its moulding edge on the fourth futtock-mould. In the same manner place it to the other timbers, marking thereon its corresponding third futtock, at the same time marking all the respective heights of the ribbands, &c. as at dead-flat. Observe, should the mould not lay towards the head of some of the foremost timbers, (as the tumble-home is left forward abaft than in midships,) measure the distance from the mould to the line of the timber on a square, and mark it on the mould; this being done to all the intermediate timbers, they may be said to be complete on that side; and when so done, it will be necessary to have a small hole bored square through the mould at every firmark, or height, upon every timber, by which means the true shape of the timbers, and places of the firmarks, may be transferred to the other side of the mould, and likewise upon the timbers when moulding.

In the same manner must be formed another mould to dead-flat for the timbers in the after-body, marking thereon all the timbers it will take. Those timbers of the square body afore or abaft the timbers already marked on the mould made to dead-flat, on account of there being more compass at the heel, may be marked upon one mould to each body, proceeding as before, only making the lower end of the mould sufficiently broad to take the most compass timbers thereon. But should the heels differ so much as to cause the lower end of the mould to be cumbersome; in that case, make moulds to each timber, as described above.

The top-timber moulds may be made in the same manner as those for the fourth futtocks, from the top of the side to the heel I, or third futtock-head.

Method of taking the Bevellings of the Timbers in the Square Body.

The moulds for the timbers of the square body being made, it is necessary to shew in what manner their bevellings may be taken; for, until then, the timbers which have bevellings cannot be cut out.

Provide a bevelling-board for the floors, in breadth as much as the floors are sided; and, in length, sufficient to take all the floor-bevellings thereon, as *Plate VII. fig. 8*. The first bevelling to be taken is from the cutting-down line for trimming the throat of the floors; but from dead-flat to floor E, they will be found to be square, or as far forward and aft as the cutting-down is parallel with the keel. They will be all represented by a square line on the board. Then, for the throating of floor F, apply the stock of the bevel to the perpendicular, or joint below the cutting-down line, and the tongue well with the cutting-down line M, as at N, *Plate VII. fig. 1*, and that will give the bevelling for the throat of floor F. Proceed in the same manner with every floor, till all those bevellings be taken and marked on the board, as *a, fig. 8*, distinguishing them by writing their respective names, as ⊕ to E, F, G, H, &c. to O. These will be all standing bevellings, both in the fore and after-bodies. In the next place, the bevellings for the outides of the floors must be taken, which are always under-bevellings in both bodies, in consequence of the floors being always placed on that side of the joint from which the body declines; these bevellings are taken at the lower diagonal *b, fig. 8*, the second diagonal, or floor-ribband, *c, fig. 8*, and floor-head *d, fig. 8*. To take these bevellings, set off the siding of each floor from its joint, or perpendicular, on each diagonal in the half-breadth plan,

Plate VII. fig. 2, (observing, as before, that the floors in the fore-body are before the joint, and those in the after-body abaft it,) the diagonal formed by the heads of the timbers being laid off in the half-breadth plan, as far as the square bodies, for that purpose, as at M, *fig. 2*; then take the distance of each diagonal on the siding line square from the middle line of the half-breadth plan, and set them down on their corresponding diagonals from the middle line in the body-plan, making spots in *Plate VII. fig. 3*. Then fix one leg of a pair of compasses on those spots of the lower diagonal, beginning with the first floor before dead-flat that has any bevelling, which is A, and, with the other leg, sweep the nearest distance to the line of its corresponding timber. That will determine when it is within a square in the breadth of the bevelling-board; and so proceed with every floor alternately to O, as at *b, fig. 8*; thus the bevellings may be taken for every floor at each diagonal, and be thence marked on the board, as *Plate VII. fig. 8*.

In the next place provide bevelling-boards, one for each futtock, and one for the top-timbers, observing that the breadth of each board corresponds with the siding of its respective futtock and top-timber; then, to take the bevellings for each, we must act as before explained for the floors; only observing which futtocks are standing bevellings, and which are under: for futtocks that have standing bevellings, the siding of the timber must be set off upon each diagonal, abaft the joint of its respective timber in the fore-body half-breadth plan, and before the joint in the after-body, and so contrariwise for those which are under-bevellings.

Therefore observe, that floors have under-bevellings, lower or first futtocks standing bevellings, second futtocks under, third futtocks standing, fourth futtocks under, and top-timbers standing bevellings. The bevellings of each may now be taken at every diagonal for every timber, and marked on their respective boards, the fore-body on one side, and the after-body on the other.

The bevellings to be taken for each futtock and top-timber are as follow: for the *lower* or *first futtocks*, lower diagonal *a*, second diagonal or floor-ribband *b*, third diagonal or first futtock-ribband *c*, and first futtock-head *d*, *Plate VII. fig. 7*. For *second futtocks*, floor-head, which is second futtock-heel, third diagonal or first futtock-ribband, first futtock-head, fourth diagonal or second futtock-ribband, and second futtock-head. For the *third futtocks*, first futtock-head, which is the third futtock-heel, fourth diagonal or second futtock-ribband, second futtock-head, fifth diagonal or third futtock-ribband, and third futtock-head. For the *fourth futtocks*, second futtock-head, which is fourth futtock-heel, fifth diagonal or third futtock-ribband, third futtock-head, main-breadth, port-fill-line, top-timber-line, and top-side. For the *top-timbers*, third futtock-head, which is the top-timber-heel, main-breadth, port-fill-line, top-timber-line, and top-side. The bevellings for the main-breadth, and all above, may be taken from the half-breadth plan, by fixing the stock of the bevel to the joint of the timber, and moving the tongue to the respective half-breadth lines.

It is necessary, in the practical application of the moulds, to have the size of the timbers the moulding-way; this must be either set off on the bevelling-boards, or on the moulds. As the latter may be reckoned the best way, first set off the scantling of the timbers the moulding-way at every head, &c. at dead-flat; thus, at the top of the sides, 6 inches, *Plate VII. fig. 3*; at the upper deck ports, N, $10\frac{1}{2}$ inches; at the gun-deck ports, M, $11\frac{1}{2}$ inches; at the third futtock-heads, I, $11\frac{3}{4}$; at the second futtock-heads, G, $12\frac{1}{2}$ inches; at the

first futtock-heads, E, 13 inches; and at the floor-heads, C, 13 $\frac{3}{4}$. Then pinning a batten to all those spots, making it fair to the cutting-down of dead-flat at the middle line, will give the scantling-line, or inner edge of timber dead-flat; then take the size or moulding at the head or heel of every timber, and set off on their respective moulds.

Then to mould the floors, the mould is laid on the timber, and the moulding edge of the intended floor is brought towards the outside of the piece; then see if there is cutting-down in the piece sufficient for bevelling, and substance below it for seating, which should be no less than sixteen inches, increasing forward and aft, as the strength may require. When that is done, if there remains sufficient wood to mould the floor agreeably to its line on the mould, which is readily seen by marking spots on the piece corresponding with the lines on the battens, and thence observing whether there is wood sufficient to mould the inside agreeably to the scantlings marked on the mould. The above-mentioned spots may be made conspicuous on the piece, and the cutting-down also marked from the mould; then its corresponding first futtock-mould will finish its moulding edge, or a pliable batten may be pinned to the spots, and the moulding edge formed as low as the piece will admit (so that it is not within the given substance below the cutting-down), the batten being fair rased by its edge; then rase up the firmarks for the diagonals to apply the bevellings. Set off on a square from the outside the given scantlings, and pin the batten thereto, as also to the cutting-down, and rase by the edge; the inside of the floor will then be completed, and the deficiency, if any, below the seating is made good by chocks.

To mould all the futtocks except the fourth, the mould need only be laid off to the outer edge of the piece; and if the piece comes near enough to the mould to allow for the scantlings and bevellings outside and inside, rase by the edge of the mould likewise the firmarks, head, and heel; then from the moulding edge set off the scantlings square from their respective places, and try if the edge of the mould will not form the inside by moving up or down; if not, it must be finished by a pliable batten, as before directed. Observe, should any of the timbers be a few inches short in the length, let them be made good by the next timber upon it, as through chocks are not to be admitted.

The fourth futtock-moulds are laid upon the piece, and should be in an horizontal position (as indeed all moulds should to try the bevellings); then see that the piece forms agreeably to the line on the mould of the timber intended to be moulded, by making a hole with a gimblet through the holes at the various firmarks belonging to the main-breadth; observing, at the same time, that the piece is strictly conformable to the head of the mould above. When both are found to agree, and there is wood in the piece sufficient for the bevellings, rase by the side of the mould inside and out as low as the main-breadth: below that it may be completed by the upper part of the corresponding third futtock-mould, keeping it well to the holes made by the gimblet at the heel and third futtock-ribband, which firmarks must be also rased up on the piece, likewise the heights of breadth, port-fill lines, top-timber line, and top-side. The inside towards the heel is finished by the scantlings given, and a batten as before described. But when fourth futtock-moulds have spilings at their heads, owing to the difference in the tumbling-home of the side, then, as the mould lies upon the piece, and the heel is found to answer, it must be seen that the upper part of the piece answers to the spiling marked upon the mould; then, towards the heel may be finished as be-

fore; but the upper part above the upper-breadth sweep must be completed by a mould made to the top-timber hollow. The top-timber line marked thereon must be placed to that given by the fourth futtock-mould, with its edge there fixed to the spiling, and its heel to the back of the upper-breadth sweep; its edge may be then rased by, and the fourth futtock will be formed up to the head or top of the side from the moulding-edge; then set off the scantling at the different firmarks, and the top-timber hollow placed to those spots will form the inner edge of the said fourth futtock, and so will the timber be completed.

Top-timbers are moulded so much like the fourth futtocks, as to render a further description unnecessary.

The moulds for the square body being finished, proceed to make moulds for the stem, stern-post, &c. The mould for the stem is made to the lines representing the fore and after sides, or moulded breadth, from the head to the heel; but in pieces, according to the number the stem is to be composed of. The rabbet is described on the mould, or represented by the batten that forms the aft-side being made parallel to the thickness of the bottom plank; but if the rabbet comes in the middle, a batten of this description must be nailed on the mould, agreeably to the rabbet in *Plate VII*. Upon this mould must be marked the heights of all the decks, likewise of the harpins and cheeks, by an horizontal line at each height across the mould. Some mark every two feet above the upper edge of the rabbet of the keel upon this mould. There should be a perpendicular line, or, in other words, a square line to set the stem by, which may be the perpendicular of the gun-deck.

The stern-post mould is made to the lines representing the fore and after sides of the stern-post, from the head to the heel, and a batten to the rabbet; then, across the mould may be marked the height of the upper side of the wing, filling, and deck-transoms at the middle line, also the heights of the harpins. Another mould is also made for the bearding-line on the post, the aft-side of which must be fayed to the bearding-line from the upper side of the wing-transom down to where the bearding-line intersects the fore-side of the inner post, and the fore-side of the mould to the fore-side of the inner post; then upon the mould must be marked the stations of the upper sides of all the transoms, marking their respective names thereon. By many, the use of this mould is superseded by marking the whole of the heights, &c. upon the stern-post mould.

Another mould may be made to the thwartship bearding of the stern-post, thus: square down the intersection of each water-line, with the fore-side of the inner post in the sheer-plan, to its corresponding water-line in the half-breadth plan; then take the several half-breadths from the middle line in the half-breadth plan, and set them off from a straight line at their corresponding heights in the sheer-plan; and a curve made to pass through those spots will be the thwartship bearding of the post, at the fore-side of the inner post, from the middle line, to which the mould is to be made; the same may be done, and a mould made to the fore-side of the stern-post.

A mould should be made to the dead-wood abaft, which is limited on the upper part by the cutting-down line, on the lower part by the upper edge of the keel, the after end by the fore-side of the inner post, and the foremost end by the aft-side of the after-floor. The mould for the dead-wood-knee is represented on it; and so likewise are the several pieces that compose the whole, as they can be gotten so as to give shift to each other. Upon this mould are fastened battens, with one edge straight to the middle line: they correspond with the stations of the square timbers; and the other edge

is hollowed to the moulding of the timbers, which gives the half-thickness of the dead-wood below the stepping or bearding-line, as marked on the mould, as all above that line the dead-wood is trimmed perpendicular to the siding of the keelson. To make this mould more conveniently, it may be made in two parts, separating lengthways at about half its depth.

To Lay-off the Cant-timbers, Plate VII. Laying-off, Plate A.

The necessity and utility of canting the timbers forward and aft, have been already explained in constructing of the sheer-draught, *Plate I.* But that the reader may have as clear an idea as possible of the design of the cant-timbers, and their disposition when canted, observe then in the half-breadth plan, *Plate VII. fig. 4*, where the lines representing the joints of the cant-timbers, as transferred from the sheer-draught, *Plate I.*, intersect the middle line, there may be supposed the hinge of a door; and the lines for the cant-timbers may be supposed to represent the door, which may be swung forward at pleasure; so that if the ship was on an even keel, the sides of the cant-timbers (though trimmed to their proper form) would become perpendicular, similar to the door; or supposing the form of the cant-timber was drawn on the door and sawed out, it would be perpendicular as before. The diagonal ribbands are similar to the cant-timbers in this respect: and as the cant-timbers at the middle line become perpendicular, making one straight section in the direction of the cant-timbers; so the cant-ribbands at their intersection of the middle line in the body-plan, *fig. 3*, become horizontal, that is, parallel to the keel at the middle line all fore and aft, provided that the ribbands for the fore and after bodies meet at the middle line, as the floor-ribbands do in *fig. 3*. Or otherwise, as the cant-timbers are represented by a door that is hung perpendicular, so may the cant-ribbands be represented by any plain surface, like the flap of a table, that may be hung horizontal to the side of a room; then will the side of the room become the middle line of the ship, equal to the middle line in the half-breadth plan, *fig. 2*, and the flap of the table may be canted down to the direction of the diagonal lines in the body-plan, *fig. 3*. To understand it clearly, suppose the edge of the flap of the table to be cut in the form of one of the diagonal ribbands laid off in the half-breadth plan, *fig. 2*; let it be the floor-ribband; then within the floor-cant-ribband in the half-breadth plan, *fig. 4*, is the square or horizontal ribband B, which is the form or distance from the middle line which the flap of the table makes when canted down, as in *fig. 3*. The cant-ribband in the half-breadth plan, *fig. 4*, is the same as the flap of the table, if lifted up till its level, shewing the extreme half-breadth of the ship, were it cut in the direction of the cant-line in the body-plan, *fig. 3*. The cant-ribband in the half-breadth plan, *fig. 4*, is the proper line to make the mould to for the harpin. But the intersection of the cant-timbers in *fig. 4*, with the cant-ribband, is not the proper station of the timbers; because the cant-ribband is now raised from its proper place, and the timbers remain as before. Therefore, where the cant-timbers cross the square ribbands, square them up to their corresponding cant-ribbands, as may be readily seen in *fig. 4*, which are the proper stations of the cant-timbers on the harpin-moulds. For if the flap of the table, which is the cant-ribband-line, and hinged at the middle line, was to fall down in its proper place, it would then be exactly underneath the long ticked line B, which is the square ribband. The stations of the square timbers on the harpin-mould will make no alteration, because the mould falls in the direction of the square timbers. Strike a straight line from the intersection

of the cant-timber with the middle line, to their corresponding stations on the harpin-mould; as at cant-timber S, *fig. 4*. This will give the direction as the cant-timbers stand on the harpin-mould.

Before we proceed any further in laying-off the cant-timbers, the fore cant-body, that is *figs. 3* and *4*, should be proved by the square timbers and water-lines, as far aft as timber M at least; for it is possible that the ribband-lines may have a fair appearance on the floor, and yet not produce a fair body in the ship; but if the water-lines and ribband-lines agree, there need be no fear of producing a fair bow, as the lines cannot be altered after the cant-timbers are laid off.

Therefore, transfer the water-lines from the body-plan, *Plate I.*, to the body-plan on the floor, and then they may be all run from timber M, and ended forward, as directed in the constructing the sheer-draught, *Plate I.* These lines laying with a more acute angle with the timbers, any unfairness in the body is more readily seen; but when the ribband-lines and water-lines produce fair curves in *fig. 4*, and likewise fair timbers in *fig. 3*, we may proceed to lay-off the square ribband-lines, which may be done in the following manner: mark on the edge of a batten the distances taken square from the middle line of the fore body-plan, *fig. 3*, to where the floor-ribband intersects each of the square timbers O, Q, S, U, X and Y. Then set them off from the middle line on their corresponding timbers in the half-breadth plan, *fig. 4*. The ending of it may be performed as the ending of its corresponding diagonal or cant-line, with only this difference, that, instead of taking the half-breadth of the stem in the direction of the diagonal line, it must be taken square from the middle line in the body-plan, *fig. 3*, to where the floor-ribband intersects the half-breadth of the stem. Then, by pinning a batten to the spots on the timbers and to the ending, is produced the curve B, or square ribband No. 2, marked on the floor S 2, and its corresponding ribband C 2, meaning square 2 and cant 2, which have a multiplicity of words; and it may be understood more clearly as we proceed, than by expressing the ribbands by their proper names, as floor-ribband, &c. Then, by proceeding in the same way with the rest of the diagonal or cant and square ribband-lines, they may be all described on the floor, as at A 1, B 2, C 3, D 4, and E 5, *Plate VII., fig. 4*.

Now proceed to the operation, where the cant-timbers in *fig. 4* intersect the square ribbands A, B, C, D, and E, or 1, 2, 3, 4, and 5. Take the nearest distance or square from the middle line, and set them off square from the middle line to intersect their corresponding ribbands in the body-plan, *fig. 3*, and from thence level out lines at pleasure, as may be seen in *fig. 3*. Then take the distance from the middle line in *fig. 4*, in the direction of the cant-timbers, to the intersections of the square ribband with the cant-timbers, and carry them to their corresponding timbers in the body-plan, *fig. 3*, setting them off square from the middle line on the lines before levelled out. This will give the spots for the timbers, and likewise the proper stations of the harpins to be crossed on the timbers.

Square up from the half-breadth plan, *fig. 4*, where the cant-timbers cross the half-thickness of the dead-wood H, to the bearding-line R in the sheer-plan. Likewise from *fig. 4*, where the cant-timbers cross the main half-breadth line, port-fill line, top-timber half-breadth, and half-breadth at top-side, let them be squared to their corresponding lines in the sheer-plan.

Take the heights in the sheer-plan, where the cant-timbers cross the bearding-line, likewise the lower and upper main-breadths,

breadths, the port-fill line, the top timber-line, and top of the side, and set them in up the body-plan, *fig. 3*, striking lines thereto parallel to the base line; then take the distance from the middle line in the half-breadth plan, *fig. 4*, in the direction of the cant-timbers, to the line for the half-breadth of the dead-wood at each timber, and set them off from the middle line in the body-plan, *fig. 3*, on the heights set up for the bearding. This will give the ending of the cant-timbers on the bearding-line.

Take the distance from the middle line in the half-breadth plan, *fig. 4*, in the direction of the cant-timbers, to the main half-breadth, port-fill half-breadth, top-breadth, and top-side, and set them off in the body-plan, *fig. 3*, square from the middle line, on their corresponding heights. This will give the spots through which the curves of the timbers are to pass by pinning a batten, and likewise the proper heights of the harpins on the timbers.

To Lay off the Bevellings of the Cant-Timbers.

Let the bevelling of cant-timber *u* be required, and this will suffice for all, as the process is alike. Strike a line afore and likewise abaft the joint of cant *u*, in the half-breadth plan, *fig. 4*, to the scantling of the timber, which should be the breadth of the bevelling-board. Square a line from the intersection of the joint with the middle line, to cross the edges or siding of the timber *u* in the half-breadth plan, as at *L*, *fig. 4*; then take the nearest distance or square to the middle line, from where the ticked line afore *u* crosses the square ribbands *A*, *B*, *C*, &c. and set it off square from the middle line in the body-plan, *fig. 3*, on each corresponding ribband, in the same manner as was done for the joint of the timber, and level them out on each side of the diagonal ribbands, because the distance taken off in the direction of the bevelling edge in *fig. 4*, will sometimes be without and sometimes within the diagonal. Then take the distance from the square line, which crosses the middle line at the joint in *fig. 4*, to the square ribbands *A*, *B*, *C*, &c. in the direction of the ticked line, before the joint or fore edge of *u*, and set them off square from the middle line in the body-plan, *fig. 3*, on their corresponding spots before levelled out. Where the same ticked line, in *fig. 4*, intersects the half-breadth of the dead-wood, square it up to the bearding-line in the sheer-plan, and transfer that height to the body-plan, *fig. 3*. Then take the distance in *fig. 4*, from the squared line, as before, to the line for the half-breadth of the dead-wood, in the direction of the ticked line; and set it off square from the middle line in the body-plan, *fig. 3*, on the height of the bearding-line, which gives a spot to finish the lower end. Where the same ticked line, in *fig. 4*, intersects the main half-breadth line, square it up to the lower height of breadth line in the sheer-plan, and transfer that height to the body-plan, *fig. 3*. Then take the distance in *fig. 4*, from the square line, as before, to the main half-breadth, in the direction of the ticked line, and set it off square from the middle line in the body-plan, *fig. 3*, on the height last set up. Then, by pinning a batten through those spots, the fore edge is produced in the body-plan from the heel to the lower height of breadth.

Proceed exactly the same with the edge abaft the joint of *u*, and the two edges will be run in the body-plan, *fig. 3*, as the ticked lines there represent, the nearest distance of which, taken with compasses, to the joint at every ribband, shews how much bevelling the timber requires at each place in the breadth of the bevelling-board; that is, if the ticked line, which is the bevelling edge of the timber, come within the joint of the timber (or nearer the middle line), then the bevelling of the timber would be so much within (or under

from) a square, consequently the ticked line without the joint will be so much without (or standing from) a square.

Figs. 5 and 6, exhibit the form of the fashion-piece and cant-timbers of the after-body, which being laid off and bevelled in the same manner as cant-timber *u* in the fore-body, it is useless to explain them; nevertheless, cant-timber 35 is completely laid off, that it may be referred to at leisure. It may be necessary to add, that the greatest pains are required to prove the correctness of the after-body, not only by the water-lines, but by the vertical sections or buttock-lines, and by introducing one or more square timbers abaft 36, to prove the buttock quite aft, and hence called proof-timbers. When these are all found to agree, it will not only produce a fair cant-body, but likewise a fair stern-frame. See *Plate IX. Laying-off C*.

Observe, the diagonal *H*, *fig. 5*, or third futtock-ribband, ends upon the aft-side of the wing-transom, which requires the following method to end it. Transfer the height from the line *A A*, or upper edge of the keel, where the diagonal *H* intersects the margin-line of the transom in the body-plan, *fig. 5*, to cross the margin-line in the sheer-plan; and where it crosses, square it down to the margin-line in the half-breadth-plan, *fig. 6*; then take the distance from the middle line in the body-plan, *fig. 5*, in the direction of the diagonal *H*, to where it intersects the margin-line of the wing-transom, and set it off from the middle line in the half-breadth-plan, *fig. 6*, on the line squared down from the margin-line, which ends the diagonal *H*, or third futtock-ribband. To end it as a square ribband, take the nearest distance, or square, from the middle line in the body-plan, *fig. 5*, to where the diagonal *H* intersects the margin-line, and set it off square from the middle line, *fig. 6*, to intersect the margin-line there; and if truly squared down for ending the cant-ribband, the ending of the square ribband will also intersect the margin-line at the same place in *fig. 6*.

Moulds are generally made to each timber, or futtock, in the cant-bodies; and in crossing or marking them, it must be observed, that the stations of the heads and ribbands are where the lines levelled out intersect the lines of the cant-timbers. On the heels of the double futtock and half-timber moulds, nail on a batten to the stepping and side of the dead-wood, by which the heel is to be cut off. To perform this, set off on the half-breadth plan, *fig. 6*, the thickness of the stepping, or dead-wood, above the stepping-line, which may be the half-thickness of the keelson, from and parallel to the middle line, as there ticked; then from the middle line in the half-breadth plan, *fig. 6*, take the distance in the direction of the cant-line to the ticked line, and set it off in the middle line in the body-plan upon the line levelled out for the heel of the same cant-timber; and from that spot square up a line to the upper side of the cutting-down, which will give the height of the inside of the timber, and will represent the side of the dead-wood to which the batten is to be nailed. A firmmark, crossed on this batten at any certain height above the keel, and carefully crossed on the side of the timber, when trimmed to correspond to a line gotten upon the dead-wood at that same height above the keel, will be the surest and best method of keeping the cant-timbers to their exact height on the ship.

Bevellings.—To take the bevellings, provide a board as broad as the scantling of the timber, and long enough to take all the bevellings of the fore-side of the joint, and likewise abaft it, as *Plate VII. fig. 9*. Begin with the fore-side of cant-timber *u*, *fig. 4*: the heel-bevelling is the first to be taken, which gives the direction to trim the heel of

SHIP-BUILDING.

the futtock the fore and aft-way, or faying to the dead-wood; therefore, the outside of the dead-wood being parallel to the middle line, apply the stock of a bevel in the direction of the joint of cant-timber *u* in the half-breadth plan, and place the tongue well with the middle line, or at the half-thickness of the dead-wood, as at *F*, *fig. 4*, letting the tongue teach forward, which will be an under-bevelling, and may be thence marked on the board. The bevelling of the heel, to trim it to the stepping or bearding-line, is next taken. Thus, where the joint of cant-timber *u* intersects the half-thickness of the dead-wood, in *fig. 4*, square it up to cross the bearding-line in the sheer-plan; and, at that place, let the tongue of the bevel be placed to the bearding-line, teaching forward, and move the stock till it is perpendicular, as at *O* in the sheer-plan, which will give the above bevelling, which may be the next marked on the board.

The outside bevelling of the heel is best obtained by trimming the heel parallel to the inside, where it fays to the side of the dead-wood, to the thickness of the stepping. Then, to take the bevelling at the lower diagonal, fix one leg of a pair of compasses in the line of the cant-timber *u*, in the body-plan, *fig. 3*, where the level line intersects, and extend the other leg to the ticked line, representing the fore edge of the timber *u*, sweeping it till you get the nearest distance, and that will shew how much the bevelling is within or without a square in the breadth of the bevelling-board; if the former, the ticked line must be towards the middle line of the joint, and of course the latter without it; then do the same with the diagonal lines, and the bevellings of each, so taken, may be marked on the board.

To take the bevellings at the main and top-breadths, and at the port-fill line between them, apply the stock of the bevel to the joint of the cant-timber *u*, in the half-breadth plan, *fig. 4*, as at *G*, and place the tongue in the direction of the respective half-breadth lines, as at top-breadth, observing to let the tongue teach forward: these bevellings are set off on the board, as taken, and the whole kept at a regular distance of about three-quarters of an inch on the left-hand side of the board; and, to complete them, mark their respective names and fore-side of cant *u*, as *a*, *fig. 9*.

The bevellings may now be taken for the aft-side of cant *u*; but the operation is performed like the former, only observing that the square line at the heel comes within side of the middle line of the half-breadth plan, and likewise when the bevel is applied to take the bevellings at main-breadth and above, the tongue of it must teach aft; these bevellings may then be marked on the same side of the board below the others, and the board for cant-timber *u* will be complete, as *b*, *Plate VII. fig. 9*.

In like manner may the bevellings be taken for cant-timber *35* at the aft-side, and marked on another board, as *a*, *fig. 10*; likewise for the fore-side, as *b*, *fig. 10*; and so on for all the other cant-timbers, both on the fore and after cant-bodies, and also for the fashion-pieces, and marked on their respective boards.

Making the Moulds, and taking the Bevellings of the Harpins,
Plate VII. Laying-off, Plate A.

The ribbands to which the harpins are connected reach along the ship fore and aft; but in the wake of the cant-bodies, or at the fore and aft parts of the ship, they are termed harpins, and are trimmed to the shape of the ship's body by moulds and bevellings from the mould-loft. The reader, in the foregoing section, being made acquainted with the nature of canting the ribbands, it may only be necessary to observe, that the ribbands at the port-fill line

would be placed better about eight inches below the upper side of the lower fill, so that they may be let out above the ribband; and likewise the ribband at the top timber-line should be so placed, that one of the sheer-strakes should be wrought before it is disturbed. This is commonly a larger ribband, like that at the floor-head, to keep the top-side fair.

The harpin-moulds are made of fir-board, to the diagonal or cant-ribband lines in the cant-bodies, *figs. 4 and 6*; from the stem or stern-post, to the adjoining square timber, as *O* and *28*, to be about seven inches broad; and as they lie in their places on the floor, mark the stations of the cant-timbers upon them thus. Where the cant-timbers intersect the square ribbands, square them up to their corresponding cant-ribbands; then striking a straight line from the intersection of each cant-timber, at the middle line of the half-breadth plan, to the corresponding stations last squared up, will give the direction of the cant-timbers as they stand with the harpin-mould, as at cant-timber *s*, *fig. 4*. The method of taking the bevellings is at every square timber, which must be likewise marked on the harpin-mould before it is displaced. The stations of the square timbers make no alterations, because the harpin is lowered to its cant in a perpendicular direction. Fix the stock of a bevel in the direction of the diagonal, say the upper one, or third futtock-ribband *H*, in the body-plan, *fig. 3*, and the tongue against the outside of the square timber *O*; then mark it on a board (the board to be as broad as the harpin is deep or sided), and so on with the other square timbers before *O*, marking each of them, and its respective timber, as before; then fix the stock of the bevel upon the same harpin-line in the body-plan, *fig. 3*, and the tongue against the side of the stem, and mark that likewise upon the board; and by that bevelling the foremost end of the harpin must be trimmed, to lay against the stem. The fore and aft part of the harpin against the stem is obtained by the foot, or swell on the fore-end of the harpin-mould, which is cut off well with the half-thickness of the stem, taken diagonally, and parallel to the middle line, in the half breadth plan, *fig. 4*. Another bevelling is taken and applied over the end, after it is cut off to the fore and aft-line, and bevelled against the stem, thus; fix the stock of a bevel upon the horizontal line of the harpin upon the stem, and teach the tongue down the aft-side of the rabbet; then mark it on the board, and the bevellings are completed. To complete the harpin-mould, square down from the sheer-plan, where the fore-side of the rabbet of the stem crosses the upper side of the harpin, to the mould on the half-breadth plan, and make a firmark, which being kept to the fore-side of the rabbet of the stem on the ship, is the guide to fix the harpin to.

To Lay-off the Hawse-Pieces, Plate VIII. Laying-off B.

This plate represents the lines on the floor, as before observed, but made separate here for clearness. The hawse-pieces, in *figs. 1 and 2*, are supposed to stand perpendicular when in their places, and their sides to look fore and aft. They may be called square timbers, only they look fore and aft, instead of athwartships. This being the first method of laying-off the hawse-pieces, will be easiest understood.

Strike in straight lines as much asunder, and parallel to the middle line in the half-breadth plan, *fig. 3*, as the knight-head and hawse-pieces are to be sided, marking them *K, H, 1, 2, 3, and 4*.

Where the edges of the foremost cant-timbers, marked *E F* in the half-breadth plan, *fig. 3*, cross the water-lines,

main-

main-breadth, and level line, at their heads A, square them up parallel to any of the square timbers, to their corresponding lines in the sheer-plan, *fig. 1*, and likewise do the same with the bearding-line, which will give the ending of the timbers on the bearding-line; then, by pinning a batten to all those spots, this shews the thwartship view of those cant-timbers when in their places, as F G.

Where the lines for the knight-head and hawfe-pieces, in the half-breadth plan, *fig. 3*, cross the water-lines, main-breadth, and heads, let them be likewise squared up to their corresponding lines in the sheer-plan, *fig. 1*; a batten pinned to those spots, making a fair line, and the edge rased or chalked by, gives the form of the knight-head and hawfe-pieces, and shews them in their proper places; and where the lines for the knight-head, and 1, 2, and 3 hawfe-pieces, meet the fore-side of the short cant-timber, before cant *y*, in the half-breadth plan F, *fig. 3*, let them be squared up to the fore-edge, G, of the same timber, in the sheer-plan, *fig. 1*; likewise the heel of hawfe-piece 4 crossing the fore-edge of cant *y*, which gives the heeling of the knight-head and hawfe-pieces.

The midship side of the knight-head connecting well with the side of the stem, the rabbet being in the middle of it, makes the aft-side of the rabbet the fore-side of the knight-head. But when the rabbet is not in the middle of the stem, it connects well with the side of the apron and dead-wood, consequently the bearding-line represents the fore-side.

Before the moulds for the knight-head and hawfe-pieces can be crossed, if made, the hanging of the harpins must be described in the sheer-plan, *fig. 1*. Thus, take their heights perpendicularly from the base line, where they intersect the square timbers, and at the side of the stem, in the body-plan, *fig. 2*, and transfer them respectively to the sheer-plan, *fig. 1*; then, by pinning a batten to those heights, we have the lines A, B, C, D, and E, or hanging of the harpins in the sheer-plan, *fig. 1*.

The heels of the knight-head and hawfe-pieces, where they intersect the cant-timber in the sheer-plan, *fig. 1*, are lined up perpendicular, in which direction they must be cut off, to lay against the side of the cant-timbers F and G.

The moulds may now be made of inch-board to the lines marked K, or knight-head, and 1, 2, 3, and 4 hawfe-pieces in the sheer-plan, *fig. 1*, from the heads to the heels, and the moulds at the heels to be cut off in the direction of the perpendicular line thereat, and while in their places mark a firmark on the moulds, wherever the harpins intersect the moulding edge of the knight-head and hawfe-pieces, also the main-breadth and head, and as many between as it may be thought necessary to apply bevellings, as may be seen at the hawfe-piece 4. The firmarks at the harpins also shew the height to keep the harpins to on the ship.

The bevellings may be next taken, and marked on a board, which should be as broad as the siding of the hawfe-piece, having a board to the knight-head, and each hawfe-piece, or all on one board, if not thought unhandy, as *fig. 4*. The first bevelling taken from the knight-head or hawfe-pieces to the side of the cant-timber in the half-breadth plan, *fig. 3*, as G for the knight-head, and H for the hawfe-piece 4, is the under bevelling. To cut off the heels to lay against the cant-timber athwartships, the bevel should be applied square from the heel, as cut off, to the perpendicular lines at the heels in the sheer-plan, *fig. 1*. But to get the bevelling at the heel to counter-mould them, when the heel is cut off and trimmed to the above bevelling, the foremost edge of cant *y* must be laid off on the square, as *i*, and on the cant, as *h*, in the body-plan, *fig. 2*, as the joint of any of the cant-

timbers were in *Plate VII.*; and so must likewise the fore edge of the cant-filling before *y*, the latter being introduced only to shorten the heel of the knight-head and foremost hawfe-pieces. Then strike in the body-plan, *fig. 2*, the siding of the knight-head and hawfe-pieces parallel to the middle line; and where the moulding edge at the heel intersects the square edge, or fore and aft view of the cant-timber, as *i* in the body-plan, *fig. 2*, level it out to intersect the cant edge *h*. To do this with less trouble, take the height in the sheer-plan, *fig. 1*, of the heels of the knight-head and hawfe-pieces at their intersection of the thwartship view of the fore edge of the cant-timbers, as F and G, and set them up in the body-plan, on their respective cant edges, marking them up perpendicular; then place the stock of the level against the perpendicular lines, and the tongue to the cant edge of the timber, as G for the knight-head, and F for hawfe-piece 4, which will give the exact bevelling to be applied on the heel when cut off for the counter-moulding of the knight-head or hawfe-pieces.

The side of the knight-head and hawfe-pieces being parallel to each other, they will serve, in the sheer-plan, *fig. 1*, for the bevellings of each other, similar to parallel lines laid down for the cant-timbers; for, as much as the moulding edge of the hawfe-piece, 1, is within or abaft the moulding edge of the knight-head, from the head to the heel, so much is the bevelling of the knight-head within or under from a square, in the distance between the knight-head and the hawfe-piece, 1, in the half-breadth plan, *fig. 3*; therefore with compasses sweep the nearest distance at each harpin, &c. from the moulding edge to the after edge of the knight-head and each hawfe-piece, as may be seen at hawfe-piece 4, in the sheer-plan, *fig. 1*, and set it within a square upon the board, as at *e*, *fig. 4*; and so on for the others.

The bevellings of the knight-head and hawfe-pieces, if taken from the water-lines, main-breadth, &c. in the half-breadth plan, *fig. 3*, would be found to alter but little; yet they are not so true in their application as when taken on a square.

But was the counter-moulding bevelling at the heel correctly set off, and another at the head for the knight-head, then the mould for hawfe-piece 1, being kept well at the head and heel, and to its proper height, must consequently counter-mould the knight-head exactly, if the knight-head could be gotten long enough to reach to the heel, or if the chock was fayed before it was moulded, and the knight-head properly sided.

In the same manner, the mould that is made to the moulding edge of the hawfe-piece 2, would counter-mould the hawfe-piece 1, and so on of the rest.

There is no necessity to run the water-lines in the half-breadth plan, *fig. 3*, on purpose to lay off the hawfe-pieces, because there is a sufficient number of square harpins already run; for in the half-breadth plan, *fig. 3*, where the knight-head and hawfe-pieces cross the square harpins, let them be squared up to their corresponding harpins in the sheer-plan, *fig. 1*, which will give the exact form of the knight-head and hawfe-pieces; and, if the work is correct, will agree with the former by the water-lines.

To Lay-off the Hawfe-Pieces, where the Sides are required to look fore and aft, and likewise to be sided less at the Heels.

Every timber in the ship which is sided straight, must appear, either in plan or elevation, as one straight line; therefore it is necessary, before any operation can be performed, to have a clear idea of the disposition of the timber when in its place. The hawfe-pieces are intended to look fore and aft, that is, at any particular height the sides of them

SHIP-BUILDING.

them are to be parallel to the middle line ; but as the heels of them are to be sided less than the heads, they will consequently be nearer the middle line ; therefore they will not appear in a straight line in the half-breadth plan, *fig. 7*, as they did in *fig. 3*, and cannot be viewed in a straight line, unless by supposing them really in their places in the body-plan, *fig. 6*.

Proceed to dispose of the knight-head and hawse-pieces as in the body-plan, *fig. 6*, where they will appear straight lines. The moulding edges are the thin lines, except the outside of hawse-piece 4, which is intended to be laid off, in order to get the bevellings of No. 4 hawse-piece.

The thwartship view of the foremost edge of cant-timber *y*, and the cant-filling before it in the half-breadth plan, *fig. 7*, which the knight-head and hawse-pieces end against, must be squared up and represented in the sheer-plan, *fig. 5*, as in the preceding operation.

The fore and aft view of the foremost edge of cant-timber *y*, and the cant-filling before it, both on the square and cant, must be laid off as *b, i*, in the body-plan, *fig. 6*, as before explained.

Now proceed to lay off the hawse-pieces, or to shew the form in which they will appear in the half-breadth plan, *fig. 7*. The knight-head is already laid off, because it is the same as the half-thickness of the stem in the half-breadth plan, *fig. 7*. Therefore take the distance square from the middle line to the heels of the hawse-pieces, where they intersect the fore and aft view of the cant-timbers *i* and *G* in the body-plan, *fig. 6*, and set them off square from the middle line in the half-breadth plan, *fig. 7*, on the edges of the cant-timbers *F* and *E* ; which gives the heels of the hawse-pieces in *fig. 7*. Take the distance square from the middle line in the body-plan, *fig. 6*, to where the hawse-pieces cross the harpins, *A, B, C, D*, and *E* ; and set them off square from the middle line, on their corresponding square harpins in the half-breadth plan, *fig. 7*. Likewise, in the same manner take the half-breadths in the body-plan, *fig. 6*, for the main breadth and the harpin at the head ; and set them off in the same manner as before in the half-breadth plan, *fig. 7*. Then pin a batten to those spots, and mark the curves in the half-breadth plan, *fig. 7*, which shews the form they will appear in, were you right over them, and looking down upon them ; occasioned by the different curves of the body when cut by these sections.

The next operation will shew the form of the body, supposing it to be cut by the different sections of the hawse-pieces, to which form the moulds are to be made to trim the hawse-pieces. Proceed in the following manner :

Where the hawse-pieces 1, 2, 3, and 4, in the half-breadth plan, *fig. 7*, cross the square harpins *c, d, e, f*, and *g* ; and likewise the main-breadth *B*, and harpin above *A* ; let them be squared up to their corresponding harpins in the sheer-plan, *fig. 5*, where they end against the edge of the cant-timbers *F* and *E* in the half-breadth plan, *fig. 7* : they may be likewise squared up to intersect the thwartship view *F* and *G* of those cant-timbers in the sheer-plan, *fig. 5*, to give the heels of the hawse-pieces. But this is not so true, as to take the heights of the heels where they intersect the fore and aft view of the cant-timbers *i* and *G*, in the body-plan, *fig. 6*, and transfer them to the sheer-plan, *fig. 5*, on the thwartship view of the said timbers *F* and *G* ; this is the proper height of the heels ; yet if both ways agree, it shews the truth of the work. Then pin a batten to those spots squared up, and mark the curves 1, 2, 3, and 4 ; this gives the moulding edges of the hawse-pieces, and shews them as they appear when in their places. This method is usually practised when required to be laid off in this manner,

and will suffice for practice ; but by explaining the situation of those at present laid off, it will sufficiently shew they are not exact, therefore we shall point out a method the most accurate.

Consider the hawse-pieces as they are now laid off, and as they appear in the sheer-plan, *fig. 5* ; you there see the exact form of them, supposing them to be in their places, and that you are looking level at them. You may therefore observe the exact form of the harpins, when you are looking level at them, where they appear at their proper heights : consequently, then, you have the exact length and form of the hawse-pieces only as they appear in a level view. And because they do not stand perpendicular, you cannot have the exact length nor form properly to mould them.

In order to shew the proper method that may be depended on, lay-off the moulding edge of hawse-piece 4, or the outside of No. 3, which will make the most difference, because it stands most from a perpendicular.

There must be supposed one given point to work from ; therefore, it being the most proper, let it be the heel. Strike the level line from the heel in the body-plan, *fig. 6*, to the heel in the sheer-plan, *fig. 5*, as *f*. If the hawse-piece 4 was not laid off in the sheer-plan, *fig. 5*, the moulding edge must be gotten up, as before, from the half-breadth plan, *fig. 7*. Therefore, as it is, strike lines upwards, perpendicular from the separate harpins in the sheer-plan, *fig. 5*, where the moulding edge of hawse-piece 4 intersects them. Then take the distance from the heel of No. 4 hawse-piece, in the body-plan, *fig. 6*, to each harpin, main-breadth, &c. taken in the direction of the moulding edge of hawse-piece 4 ; and set them up perpendicular from the heel of hawse-piece 4, in the sheer-plan, *fig. 5*, on the lines before squared up, at their corresponding harpins : then pinning a batten to those spots, mark the curve in *fig. 5*, which will give the exact moulding of the hawse-piece, and the heights for the stations of the harpins to be crossed on the hawse-piece moulds.

Though the exact and proper method to lay-off the hawse-pieces is described by laying off No. 4, the explanation must suffice for this, being too minute to be drawn on the plate. Yet the first method is not entirely to be condemned, as they are shewn in the sheer-plan, *fig. 5*, because it makes so little difference in the moulding, that the error is not to be regarded in the practice. The greatest difference it makes is in the length, which, in No. 4, does not make it two inches longer. But the certainty of the latter method being the most correct, must be proved by working at extremes ; that is, suppose the head of hawse-piece 4 to stand where it is in the body-plan, *fig. 6*, and the heel to be fixed at the middle line, then, if laid off by both methods, the difference would be readily seen, which method is best to be depended on.

The moulds for the knight-head and hawse-pieces are made to the lines in the sheer-plan, *fig. 5*, as before directed.

The bevellings, supposing the hawse-pieces to be properly laid off in the sheer-plan, *fig. 5*, are taken in the same manner as was shewn in *fig. 1* ; for though they do not appear in the same manner in the half-breadth plan, *fig. 7*, yet in the sheer-plan, *fig. 5*, (their sides looking fore and aft,) you there see the form of them square from the plans of their separate sides : therefore the distance, as they appear from each other in the sheer-plan, *fig. 5*, at each harpin, is the proper bevelling of them, agreeable to their distance from each other taken at their corresponding harpins in the body-plan, *fig. 6*.

Where the heels of the hawse-pieces step on the thwartship view of the cant-timbers in the sheer-plan, *fig. 5*, line them

them up perpendicular; which gives the disposition of the heels of the hawse-pieces to lay against the fore-side of each cant-timber.

The bevelling of the heels of the hawse-pieces must likewise be done the same as in *fig. 3*; for though in the half-breadth plan, *fig. 7*, the form of the moulding edges of the hawse-pieces appear in this view, yet the sides of them, at level heights, are exactly fore and aft; therefore the bevellings to trim the heels to lay against the side of the cant-timber, is the same for all the hawse-pieces, and must be taken with the stock of the bevel looking fore and aft, or parallel to the middle line, as is expressed by the bevel *G*, which is applied in the half-breadth plan, *fig. 7*, to take the bevelling of No. 4 hawse-piece.

To take the bevelling of the heel, to be applied when the heel is trimmed by the last bevelling, in order to counter-mould the hawse-pieces, transfer the heels of the hawse-pieces from the sheer-plan, *fig. 5*, to the cant-timber in the body-plan, *fig. 6*, as for taking the bevelling of the hawse-piece 4, and strike up a perpendicular line, to which apply the stock of the bevel, and the tongue to the fore cant-edge, as at *c*, *fig. 6*. This gives the bevelling of the heel, in order to counter-mould the hawse-pieces.

As the most accurate method of moulding the hawse-pieces has been treated of, it is requisite it should be so respecting the disposition of the heels, and the bevelling of the heels. As the bevelling of the heel is shewn for No. 4 hawse-piece, the following will explain the difference that may be expected, if the hawse-pieces were required to be laid off on extremes, or if a section of the body were required in such direction.

Set up any particular height on the hawse-piece 4, in the body-plan, *fig. 6*, and suppose it to be the height where the harpin *C* intersects it; then take that height from the heel of the hawse-piece No. 4, in the direction of the line of the hawse-piece, and set it up perpendicular from the heel of No. 4 hawse-piece, in the sheer-plan, *fig. 5*. Take the distance square from the middle line at the proposed height in the body-plan, *fig. 6*, and set it off square from the middle line in the half-breadth plan, *fig. 7*, on the cant edge *E*; there make a spot, and carry it square up to the ticked level line in the sheer-plan, *fig. 5*, and strike the line from thence to the heel of No. 4 hawse-piece, which gives the exact form of the heel to lay against the fore-side of cant-timber *y*.

From the spot before mentioned in the half-breadth plan, *fig. 7*, take the distance to the middle line in the direction of the cant-timber, as *E*, and set it off from the middle line in the body-plan, *fig. 6*, on the ticked level line, and draw it down to the heel of the timber; which is the proper line to which the stock of the bevel should be applied to take the bevelling of the heel, in order to counter-mould the hawse-pieces. The explanation of the above must suffice, as it would not only interfere with the method laid off, but also be too minute to be described on the plate.

Where the hawse-pieces in the half-breadth plan, *fig. 7*, cross the square harpins *c, d, e, f*, and *g*, square them up to their corresponding cant-harpins, as at *h*, which gives the proper stations of the hawse-pieces on the cant-harpins; but the direction of the hawse-pieces to be marked on the harpin-moulds will be fore and aft, as well on the cant-harpins as on those which lie level: such are the harpins at the port-fill and head; for where the hawse-pieces cross those harpins in the half-breadth plan, *fig. 7*, is the proper station of the hawse-pieces on the aforesaid harpins; or otherwise it is the proper distance from the middle line which the hawse-pieces will be on each harpin, when the harpins are

in their places; because those harpins are shewn in the half-breadth plan, *fig. 7*, as they really appear when they are in their places.

To Lay-off the Hawse-Pieces when canted.

The method of laying off and disposing of the hawse-pieces when canted, is the most complete of any, as it is the best for the strength of the ship, and will likewise assist the conversion of the timber; for by canting them, they will not only be diminished at the heels, whereby a less piece of timber will make them, as in the foregoing method, but the bevellings will be less acute; and as the canting and diminishing of them at the heels are performed by one operation, they consequently must appear as straight lines when viewed in the half-breadth plan; and, as before observed, that all timbers, when canted nearer to a square with the body, add more to the security of the plank, and the timbers are not wounded so much by that security. The canting of the hawse-pieces is also some advantage to the hawse-holes; for although the hawse-holes are generally cut nearly parallel to the middle line, yet canting of them leaves most wood at the outside of the hawse-hole, which is the farthest from the middle line, as it is the wearing side of the hawse-hole.

Dispose of the hawse-pieces in the half-breadth plan as in *fig. 11*, on which plan they will be straight lines, similar to the cant-timbers. Strike in likewise the fore-side of the cant-timbers marked *E, F*, as before, against which the heels of the hawse-pieces are to be cut off.

Lay off the thwartship view of the hawse-pieces and fore-side of the above cant-timbers *E, F*, in the sheer-plan, *fig. 9*, in the following manner. Where the fore-side of the cant-timbers *E* and *F* in the half-breadth plan, *fig. 11*, crosses the half-thickness of the dead-wood *C*, square them up to the bearding-line in the sheer-plan, *fig. 9*, and in the same manner proceed at every water-line, 1, 2, 3, 4, 5, and 6; likewise with the main-breadth and harpin at the beak-head: then pin a batten to those spots, and mark the curves, as *F, G*, which gives the thwartship view of the fore-side of the cant-timbers the hawse-pieces heel against.

In the same manner proceed with the hawse-pieces: where, in the half-breadth plan, *fig. 11*, they intersect the water-lines, main-breadth, and harpin above, square them up to their corresponding lines in the sheer-plan, *fig. 9*; and where they intersect the fore-edges of cant-timbers *E* and *F* in the half-breadth plan, *fig. 11*, square them up to intersect the thwartship view of the said cant-timbers, as *F* and *G* in the sheer-plan, *fig. 9*. This shews the exact height of the heels of the hawse-pieces, where they step against the cant-timber, when they are in their places. Then by pinning batten to all the spots squared up, mark the curves 1, 2, 3, and 4, which will give the exact thwartship view of the hawse-pieces, supposing they were in their places; but as the sides do not look fore and aft, these are not the proper lines to make the moulds to; but will be serviceable hereafter, to get the proper height of the harpins to be crossed upon the hawse-piece moulds. The moulding edge of the knight-head is the aft-side of the rabbet of the stem.

Where the knight-head and hawse-pieces intersect the fore-side of the cant-timber, marked *E* in the half-breadth plan, *fig. 11*, fit a batten in the direction of the line of the knight-head, or hawse-pieces; mark thereon the points where they are intersected by the water-lines; and set them off from the middle line in the body-plan, *fig. 10*, on their corresponding water-lines. Then take the heights, where the heels of the knight-head and hawse-pieces intersect the thwartship view of cant-timber *F* in the sheer-plan, *fig. 9*, and transfer them to the middle line in the body-plan, *fig. 10*.

Having

SHIP-BUILDING.

Having the lower height of breadth and harpin at the beak-head laid off in the sheer-plan, *fig. 9*, take the heights where they intersect the thwartship view of the knight-head and hawse-pieces, and transfer them to the body-plan, *fig. 10*. Then take the distances in the half-breadth plan, *fig. 11*, from the intersection of the knight-head and hawse-pieces, with the cant-timber marked E, to the main-breadth and harpin at the beak-head, taken in the direction of the line, and set them off from the middle line in the body-plan, *fig. 10*, on their corresponding lines, marking spots. Then by pinning a batten to those spots, mark the curves K, H, 1, 2, 3, and 4, which are the proper moulding edges of the knight-head and hawse-pieces, and consequently those to which the moulds are to be made. Now to give the direction for cutting off the heels to lay against the side of the cant-timber, the mould of No. 4 hawse-piece must be cut off well with the middle line in the body-plan, *fig. 10*; but as the knight-head and the other hawse-pieces cut off against the timber, before that which No. 4 heels against, take the height in the sheer-plan, *fig. 9*, where the heels of the knight-head, and 1, 2, 3 hawse-pieces intersect the thwartship view of the foremost cant-timber at G, and transfer them to the body-plan, *fig. 10*; and where they intersect their respective hawse-pieces, there strike up a perpendicular line, as at No. 3 hawse-piece, which will also give the direction to cut off their heels against the said cant-timber.

But now, since they are laid off by the water-lines, the proper stations of the harpins below the main-breadth cannot be marked on the moulds. Therefore the level thwartship view of the harpins must be laid off in the sheer-plan, *fig. 9*, as before, which is the exact height of them when they are in their places; consequently, then, the points where they intersect the thwartship view of the knight-head and hawse-pieces, shew the exact height to be transferred from the sheer-plan, *fig. 9*, to their corresponding lines in the body-plan, *fig. 10*, which gives the exact stations of the harpins to be crossed on the knight-head and hawse-piece moulds.

The bevellings are to be taken thus: strike a line in the half-breadth plan, *fig. 11*, to the siding of the knight-head and hawse-pieces, as was done for bevelling the cant-timbers, as the ticked line at No. 4 hawse-piece, it being the clearest to be understood. Then square a line at the heel, where the moulding edge of No. 4 hawse-piece crosses the cant-timber marked E. Then take the distance from the squared line in the direction of the siding or ticked line to the separate water-lines, where they intersect the ticked line, and set them off from the middle line in the body-plan, *fig. 10*, on their corresponding water-lines. Where the ticked line in the half-breadth plan, *fig. 11*, intersects the cant-line E, square it up to intersect the thwartship view F, in the sheer-plan, *fig. 9*, as marked with a star, and from thence transfer it to the body-plan, *fig. 10*, as far as the middle line. Then take the distance from the squared line at the heel in the half-breadth plan, *fig. 11*, to the cant-line E, in the direction of the ticked line, and set it off from the middle line in the body-plan, *fig. 10*, at the height last mentioned. Continue the ticked line or siding of the hawse-piece to intersect the water-lines 1, 2, and 3, in the half-breadth plan, *fig. 11*; then take the distance from the squared line at the heel to those water-lines in the direction of the siding or ticked line, and set them off from the middle line in the body-plan, *fig. 10*, on their corresponding water-lines to the left hand, which serves to prove the spot at the heel by continuing the bevelling edge to the lowest water-line. Where the ticked line or siding of the hawse-piece 4, in the half-breadth plan, *fig. 11*, intersects the main half-breadth and beak-head harpin, square them up to their corresponding lines in the sheer-plan, *fig. 9*, and trans-

fer them to the body-plan, *fig. 10*, striking level lines. Then take the distance from the squared line at the heel in the half-breadth plan, *fig. 11*, to the main half-breadth and beak-head harpin in the direction of the siding or ticked line, and set them off from the middle line in the body-plan, *fig. 10*, on their corresponding heights, which gives the spots to which a batten must be pinned, and the curve marked out thereby will be the bevelling edge of the hawse-piece 4; and at whatever distance the bevelling edge in the body-plan, *fig. 10*, is from the moulding edge of the hawse-piece 4, so much is the hawse-piece under from a square in the distance from the siding or ticked line, to the joint of the hawse-piece in the half-breadth plan, *fig. 11*.

The bevel G, as shewn in the half-breadth plan, *fig. 11*, gives the direction to cut off the heel. When the heel is cut off, in order to find the bevelling of the heel to counter-mould the hawse-pieces, the fore-sides of the cant-timbers, as E and F, in the half-breadth plan, *fig. 11*, must be laid off in the body-plan, *fig. 10*, which may be done by the water-lines. Then transfer the height of the heel of the hawse-piece No. 4, from the sheer-plan, *fig. 9*, where it cuts the thwartship view of the cant-timber marked F, to its corresponding cant-timber in the body-plan, *fig. 10*, and strike a perpendicular line; to which apply the stock of a bevel, and the tongue, to the cant-timbers, as at M; the same likewise for hawse-piece No. 1, as at L, and so on for the others. This gives the exact bevelling to be applied when the heel is cut off, in order to counter-mould the hawse-pieces, if it should be so required. The bevellings of No. 4 hawse-piece are all taken at their heights, as may be seen in the body-plan, *fig. 10*, and marked on the bevelling-board, as at a in *fig. 12*: the said heights to be all crossed upon the hawse-piece mould.

To Lay-off the Hawse-Pieces by the Square Harpins when canted.

The square and cant-harpins being of necessity laid off in the half-breadth plan, *fig. 11*, it is necessary to explain the method of laying off the cant-hawse-pieces by the square harpins, which are marked c, d, e, f, g, in the half-breadth plan, *fig. 11*. The point where the knight-head and hawse-pieces intersect the fore-side of the cant-timber marked E in the half-breadth plan, *fig. 11*, is supposed to be in the middle line in the body-plan, *fig. 10*, which middle line will serve for laying off the knight-head and hawse-pieces, as it did for the foregoing operation by the water-lines. By being laid off in the same body-plan, *fig. 10*, it will be a convincing proof that both methods may be depended upon, because they will be found to agree, as near as can be expected on so small a scale as the plate.

To explain the laying off the knight-head and all the hawse-pieces would be too tedious; (though they are all laid off the same in the body-plan); for by laying off and bevelling the hawse-piece No. 4, the ticked lines (which are transferred from the sheer-plan, *fig. 9*, to the body-plan, *fig. 10*, in order to give the proper stations of the harpins on the hawse-piece moulds, when laid off by the water-lines) will now be proved to agree with the operation by the harpins.

Now the knight-head and hawse-pieces are intended to be laid off together by the harpin-lines. There is no necessity to lay-off the thwartship view of them in the sheer-plan, *fig. 9*; but the thwartship view of the fore-side of the cant-timber they heel against will be wanted, to find the height of the heels. Having the level height of the harpins laid off before in the sheer-plan, *fig. 9*, where the fore-sides of the cant-timbers, marked E, F, intersect the square

square harpins *c, d, e, f, g*, in the half-breadth plan, *fig. 11*, square them up to their corresponding harpins in the sheer-plan, *fig. 9*. This gives the thwartship view of the cant-timbers; and if the work be true, it will answer the same as by the water-lines. The exact height of the heels should be found, in order to prove the rest of the work; and as the lines of the hawse-pieces in the half-breadth plan, *fig. 11*, are continued abaft the fore-side of the cant-timbers, as *E, F*, to intersect the square harpins *c, d, e*; then by having spots in the body-plan, *fig. 10*, beyond the middle line, (when the batten is continued to the spots beyond the middle line on those harpins,) it would intersect the middle line at the proper height of the heel of the hawse-piece.

To prove the hawse-piece No. 4, as laid off by the water-lines, let it be laid off by the level or square harpins: thus, where the moulding edge intersects the fore-edge of the cant-timber, marked *E* in the half-breadth plan, *fig. 11*, square it up to intersect the thwartship view *F*, in the sheer-plan, *fig. 9*; and transfer that height to the middle line in the body-plan, *fig. 10*. This gives the heel of the hawse-piece No. 4, exactly similar to the method by the water-lines.

Observe in the half-breadth plan, *fig. 11*, where the hawse-piece No. 4 crosses the square harpins, and from thence take the nearest distance to the middle line; and set them off on their respective harpins square from the middle line in the body-plan, *fig. 10*, there striking a level line, in the same manner as was done for the cant-timbers. Then take the distances in the half-breadth plan, *fig. 11*, from the intersection of the hawse-piece No. 4, with the cant-edge marked *E*, to where it intersects each of the square harpins, in the direction of the line for the said hawse-piece; and set them off square from the middle line in the body-plan, *fig. 10*, on their respective level lines before mentioned; observing to set off the distance to the left hand of those which were taken abaft the cant-line *E*. This gives the spots for the moulding edge of the hawse-piece No. 4; and is likewise the exact station of the harpins to be crossed on the moulds.

Proceed in the same manner to find the spots for the moulding edges of the other hawse-pieces; as those for the main-breadth and beak-head harpin are found in the very same manner as by the water-lines.

The *bevelling-edge* is laid off in the very same way as the moulding edge; only the distance taken in the direction of the ticked or siding-line is taken from the squared line at the heel, instead of its intersection at the cant-edge *E*, in the half-breadth plan, *fig. 11*. The plate will shew that the difference of laying-off, between the water-lines and harpins, is in the performance only.

To find the proper stations of the knight-head and hawse-pieces on the harpin-moulds, we need only square up the intersections of them with the square harpins to the cant-harpins, in the same manner as was done for the cant-timbers. And the points where the knight-head and hawse-pieces in the half-breadth-plan, *fig. 11*, cross the harpins at the port-fills and beak-head, shew the proper stations of them, as they appear when the harpins are in their places, they lying level in a thwartship direction to the sheer of the ship, the fore and aft-way. The main breadth is only used as a bevelling spot; for was it required to place a harpin to that height, its great sheer would require a very different operation to form the line to make the mould to.

To Lay-off the Transoms, Plate IX. Laying-off C.

The transoms and fashion-pieces compose the stern-frame. The upper ones are the wing, filling, and deck-transoms;

and there may be as many under the deck-transom as the form of the body will admit, of kindly growth. The uppermost is called the wing-transom, which is the base of the stern.

This may be admitted the strongest and best method of uniting the after-part of the ship together: the strongest, because every transom crossing the after-part of the ship, and bolting through the stern-post, they may be considered similar to the breast-hooks; so that when the planks are wrought on the buttock, and the wing-transom knees, and sleepers or diagonal knees are bolted, it may be allowed to be as strong as the fore-part or bow is with the breast-hooks, because the fore-part of the ship has no other assistance to keep the bows together.

As there are several operations required to lay-off the stern-frame, *Plate IX*. Laying-off C, is made a separate plate for that purpose; though it represents the lines on the floor, as before observed.

The fashion-pieces being struck in the half-breadth plan on the floor, and the water-lines run as in *Plate I*., square up the intersection of the fashion-pieces with the bearding-line, water-lines, the end of the wing-transom, and main half-breadth line in the half-breadth plan, to their corresponding bearding-line, water-lines, wing-transom, and height of breadth line in the sheer-plan; then a batten pinned to those spots will represent the thwartship view of the aft-sides of the fashion-pieces *T, F, P*, *Plate IX. fig. 1*.

Where the aft-sides of the fashion-pieces intersect the before-mentioned lines in the half-breadth plan, take the distances square from thence to the middle line; and set them off square from the middle line, on their corresponding lines in the body-plan. A batten pinned to these spots will give the fore and aft view of the fashion-pieces, generally called the square fashion-pieces, which are marked *S, F, P*, *Plate IX. fig. 2*.

Transfer from the sheer-plan of *Plate I*. the heights of all the transoms to the sheer-plan on the floor; likewise the siding or depth of each transom, as *W, F, D, 1, 2, 3, 4, 5, and 6*, *Plate IX. fig. 1*.

In the body-plan, *fig. 2*, describe the upper side of the wing-transom *a*, by a segment of an arc to its round-up, till it intersects the aft-side of the foremost square fashion-piece *S*; and below that a parallel curve *b*, where the ends of the planks of the buttock are intended to be cut off, which is called the *margin-line*. Square down from the sheer-plan the aft-side of the wing-transom to the middle line of the half-breadth plan; and from thence describe the aft-side of the wing-transom at its upper side, by a segment of an arc to its round-aft, which shews the line to which the mould is to be made. Take the height of the margin-line *b*, at the middle line in the body-plan, *fig. 2*, and transfer it to the fore-part of the rabbet of the stern-post, in the sheer-plan, *fig. 1*; and from thence square it down to the middle line in the half-breadth plan, marking a parallel arc to the aft-side of the wing-transom, which is likewise called the margin-line. Continue to shew the level view of the moulding edges of all the transoms in the body-plan, *fig. 2*, in the following manner: the wing-transom and the filling under it lying level, they form the segment of an arc to their round-up, as above. This is the proper curve to which the round-up mould is made for siding those transoms. The next is the deck-transom, which is generally laid off to the round-up of the gun-deck beam; the other transoms below the deck lying straight and level, are represented by level lines only.

Transfer from *Plate I*. the buttock-lines *1, 2, 3, 4, 5, and*

SHIP-BUILDING.

and let them be struck on the floor in the body-plan and half-breadth plan. Then proceed to run the buttock-lines in the sheer-plan, *fig. 1*, as directed in the construction of the sheer-draught, *Plate I*. The buttock-lines, the square timbers, and likewise the water and ribband-lines, should be made to agree to the greatest exactness.

The moulding edges of the other transoms may now be laid off from the buttock-lines in the sheer-plan, *fig. 1*; but if they are laid off in the half-breadth plan, then only half or one side can be represented. The best method, therefore, will be to lay them off in some convenient place on the floor by themselves, whereby both sides may be represented, and there will not be then such confusion in the lines. This, for distinction, may be termed *plan of the transoms*, as *Plate IX. fig. 3*.

The moulding edge of the wing-transom is already described to which the mould is to be made; the filling-transom is next, which lies between the wing and deck; and as it lies horizontally, the description of it will suffice for all the other transoms that come under the deck, which also lie horizontally.

As there is no more trouble in laying-off a transom which is sided straight, and lies level, than there is in laying-off a water-line, strike on each side of the middle line M, in the plan of the transoms, *Plate IX. fig. 3*, the half-thickness of the dead-wood or bearding-line, *a a*, taking it from the body-plan, *fig. 2*, (and as low down as the deck-transom the inner post is sided the same); likewise the buttock-lines. Take from the half-breadth plan the square timbers 32, 33, 34, 35, 36, and the proof timbers 1 and 2, and strike them in the plan of the transoms, *fig. 3*, at right angles with the middle line; also strike in the cant of the fashion-pieces F, M, A. Then strike a perpendicular line, P, in the sheer-plan, *fig. 1*, at the intersection of the upper edge of the wing-transom, at the fore-part of the rabbet; likewise another at right angles with the middle line, at the aft-side of the wing-transom, as P P, in the plan of the transoms, *fig. 3*.

Now from the perpendicular P, above mentioned, called *perpendicular of the transoms*, take the distance in the sheer-plan, *fig. 1*, to where the upper side of the filling-transom, F, intersects the fore-side of the rabbet of the post or bearding-line B, and set it off from the same line P P, in the plan of the transoms, *fig. 3*, at the middle line, squaring a line across to each bearding-line; which line will be the after-part of the filling-transom at the middle line. Observe where the bearding-line, C, of the post, in the sheer-plan, *fig. 1*, comes before the fore-side of the rabbet, to take the aforesaid distance to the bearding-line of the post, as that terminates the after-part of all the transoms; then take the distances in the sheer-plan, *fig. 1*, from the perpendicular line P, to where the line representing the upper side of the filling-transom intersects the different buttock-lines 1, 2, 3, 4, and 5, and set them off from the same line P P, in the plan of the transoms, *fig. 3*, on their corresponding buttock-lines on each side of the middle line. Then take the distances in the body-plan, *fig. 2*, from the middle line, to where the upper side of the filling-transom, *c*, intersects the square timbers, and set them off on both sides of the middle line on their corresponding timbers, in the plan of the transoms, *fig. 3*; then by pinning a batten through the spots on the buttock-lines and square timbers, to its after-part at the side of the bearding *c c*, the moulding edge or upper side of the filling-transom will be described on one side the middle line; the mould may then be made to that side, and canted over, and the opposite side marked thereby, being sure thus to have both sides alike. This filling-transom

having been laid off horizontally, of course, when moulding the filling-transom, the mould must lie in an horizontal position; but having so little room between the wing and deck-transoms, it becomes necessary to give the filling-transom a round-up between both. Those who would be more correct in laying-off transoms, that have a round upwards, may see the subject farther explained in the following methods.

To lay-off the deck-transom, strike a straight line in the sheer-plan, *fig. 1*, at the under-side of the deck, at the middle line, to take that part of the hang of the deck only, which is terminated between the rabbet of the stern-post and the fashion-piece, as H, *fig. 1*. Then take the round of the deck R, at every buttock-line, as under the body-plan, *fig. 2*, and set them off below and square to the straight line H, in the sheer-plan, *fig. 1*, marking parallel lines thereto, to intersect their corresponding buttock-lines, which gives the moulding edge of the transom. Proceed in the same manner with the lower edge, by striking a line for the lower side of the transom at the middle line parallel to the former; and set the round down, as before, upon any buttock-line.

The upper and lower sides of the deck-transom being obtained on the buttock-lines, in the sheer-plan, *fig. 1*, transfer their heights from the sheer-plan, *fig. 1*, to the body-plan, *fig. 2*, respectively; then by pinning a batten to those heights, the upper and lower sides of the deck-transom, *d d*, may be represented in the body-plan, *fig. 2*.

The lines above mentioned, in the sheer-plan, *fig. 1*, parallel to the sheer of the deck, at the intersection of the buttock-lines and fashion-piece, should be continued aft to the perpendicular P; then take the distances from that line, in the direction of the parallel lines, to the buttock-lines and fashion-piece, and set them off square from the said line P P, in the plan of the transoms, *fig. 3*, on their corresponding buttock-lines and fashion-piece. Next take the half-breadth from the body-plan, *fig. 2*, at the intersection of the deck, at the side, with the square timbers, and set them off on their corresponding timbers from the middle line, in the plan of the transoms, *fig. 3*; then by pinning a batten to those spots, this forms the moulding edge of the deck-transom D D.

The transoms under the deck, all lying horizontally, may be laid off by taking the distances of the buttock-lines and bearding-line from the perpendicular P, in the sheer-plan, *fig. 1*, on the upper edge of each transom, and setting them off on their corresponding buttock-lines from the same perpendicular P P, in the plan of the transoms, *fig. 3*; and also at the timbers from the middle line in the body-plan, *fig. 2*; and set them off from the middle line on their corresponding timbers in the plan of the transoms, *fig. 3*: a batten pinned to those spots will represent the moulding edges of all the transoms.

To prove the intersection of the transoms with the side of the fashion-piece, which is the end of each transom, as already laid off in the plan of the transoms, *fig. 3*. Thus, where the upper side of the wing-transom in the body-plan, *fig. 2*, intersects the foremost square fashion-piece S, level it out to intersect the cant-fashion-piece *c*. Then take the nearest distance from the cant-fashion-piece at that place to the middle line, and set it off from the middle line in the plan of the transoms, *fig. 3*, in the direction of the line of the foremost fashion-piece F. In the same manner prove the filling and deck-transoms. Take the distances from the middle cant-fashion-piece to the middle line along the upper side of Nos. 1, 2, and 3 transoms in the body-plan, *fig. 2*, and set them off on the middle cant-fashion-piece M, from the middle line in the plan of the transoms, *fig. 3*, as before. Take likewise the

the distances from the aftermoſt cant-fashion-piece to the middle line for the tranſoms 4, 5, and 6, and ſet them off, as before, on the line for the aftermoſt cant-fashion-piece A, in the plan of the tranſoms, *fig. 3*; to which ſpots the tranſoms in *fig. 3*. muſt agree.

Cut off the ends of the wing, filling, and deck-tranſoms, at the joint or aft-side of the foremoſt fashion-piece F, and tranſoms Nos. 1, 2, and 3, under the deck at the aft-side of the middle fashion-piece M, and Nos. 4, 5, and 6, at the aft-side of the after-fashion-piece A, as is clearly ſhewn in the plan of the tranſoms, *fig. 3*, where the middle fashion-piece is represented as flopt at the under ſide of the deck-tranſom, and the after-fashion-piece at the under ſide of the tranſom No. 3.

To make the Moulds and bevel the Tranſoms.

The moulds are made of fir battens fayed to the lines already laid off in the plan of the tranſoms, *fig. 3*, for their aft-sides; and another to their fore-side, at their moulding or breadth at the upper ſide; which are confined together by battens at each buttock-line, and one at each end to the direction of the fashion-piece, allowing what they are intended to be let into the fashion-pieces; and a broad piece in the middle, to the ſize of its ſeating *cc*, with the middle line correctly marked thereon.

The *bevellings* of the tranſoms are frequently taken from the buttock-lines in the ſheer-plan, *fig. 1*, in the following manner. Apply the ſtock of the bevel E to the upper ſide of the tranſoms, in the ſheer-plan, *fig. 1*, and the tongue to the buttock-line; but let the tongue be off at the upper and lower ſides of the tranſom, as at the filling-tranſom in the ſheer-plan, *fig. 1*, which gives the exact bevellings of the tranſoms at their correſponding buttock-lines.

The bevellings for the wing-tranſom are taken from the margin-line to the under ſide of the wing-tranſom, as above. The under ſide of the wing-tranſom is transferred from the body-plan, *fig. 2*, to the ſheer-plan, *fig. 1*, by the buttock-lines.

The bevellings for the deck-tranſom may be taken by applying the ſtock of the bevel parallel to the hang of the deck, at the middle line, and the tongue to each buttock-line; keeping the tongue well at the upper and lower ſides of the tranſom, as before obſerved, and ſo muſt be applied on the tranſom, by placing the bevel at each correſponding buttock-line, and keeping the ſtock out of winding with the upper ſide of the tranſom at the middle line.

The tranſoms under the deck may be bevelled by the buttock-lines in the ſheer-plan, *fig. 1*, and the bevellings may be taken very exact; but it requires to be very particular in applying the bevel on the tranſoms; to do which, the ſtock of the bevel muſt be kept in the direction of the buttock-lines, at the upper ſide of the tranſom, and the tongue teaching to the buttock-line below, which ought to be marked at the lower ſide of the tranſom, and not truſting to the bevel's canting promiſcuouſly, for then the bevel may not be exactly ſquare.

When this trouble is taken to bevel the tranſoms, then they may, when trimmed, be depended upon.

This is a method not to be recommended to thoſe who would be particularly exact, becauſe there can be no more bevellings on the tranſoms than the number of buttock-lines which interſect the tranſoms: as for inſtance, there are only two buttock-lines which croſs the lower-tranſom in *fig. 3*, and one of them is cloſe to the end, which is not ſufficient to get the exact form of the lower ſide of the tranſom. Therefore, the beſt way to find the bevellings of thoſe tranſoms is to lay-off their lower ſides, which is very eaſy to be

effected here, becauſe all the tranſoms lie level. Proceed in the ſheer-plan, *fig. 1*, at the under ſide of the lower tranſom, to take the diſtance from the perpendicular of the tranſom P, to the interſection of each buttock-line, and likewise the bearding-line; and ſet them off from the line P P, on their correſponding buttock-lines and bearding-line, in the plan of the tranſoms, *fig. 3*. Then from the middle line of the body-plan, *fig. 2*, take the diſtances at the lower ſide of the ſaid tranſom to the ſquare timbers, in the ſame manner as the moulding edges were done, and ſet them off on their correſponding timbers, in the plan of the tranſoms, *fig. 3*, which gives the ſpots; to which a batten pinned will give the form of the lower edge L L, which is ticked, to diſtinguiſh it from the moulding edge. In the ſame manner may be laid off the lower or bevelling edges of all the tranſoms.

The diſtance from the upper or moulding ſides of the tranſoms, to the ticked line for the lower ſides, ſhews how much the tranſoms are under from a ſquare; only in the diſtance from the upper to the lower ſides of the tranſoms, in the ſheer-plan, *fig. 1*, muſt be ſuppoſed the breadth of the bevelling-board.

By having the lower ſides of the tranſoms laid off, we have an opportunity of taking as many bevellings as may be thought ſufficient, without any confinement; therefore, on the lower tranſom may be placed three bevelling ſpots, which ſhould be divided equally between the breech and the fashion-piece; then take the neareſt diſtance from the ſpots on the moulding edge, (which muſt be firmarked on the moulds,) to the ticked line for the lower edge, by ſweeping it with a pair of compaſſes, which ſhews how much the tranſom is under from a ſquare at each bevelling ſpot, as at *a, b, c*, in the plan of the tranſoms, *fig. 3*, agreeable to the depth of the tranſom. In the ſame manner may the bevellings of all the tranſoms below the deck be taken.

The bevelling for the breech of the tranſom is taken from the upper ſide of the tranſom, and the tongue to the bearding-line in the ſheer-plan, *fig. 1*; for the tranſoms are all ſuppoſed to be cut off in the direction of the bearding-line C. The ends of all the tranſoms, when moulded, are trimmed ſquare from the upper ſide. But the ſquare, when applied to the end of the wing, filling, and deck-tranſoms, muſt be lifted up as much as the tranſom rounds down, and appears out of winding with a batten in the middle line.

To find the bevelling for the ends of the tranſoms, when cut off, let the ſtock of the bevel be placed to the lines of the upper ſides of the tranſoms in the body-plan, *fig. 2*, and the tongue to the cant-fashion-piece, which gives the proper bevelling over the end of the tranſoms when cut off.

But to find the bevelling for the end of the wing-tranſom, take the diſtance ſquare from the middle line to the interſection of the joint, or aft-side of the foremoſt fashion-piece, with the end of the wing-tranſom, in the plan of the tranſoms, *fig. 3*, and ſet it off ſquare from the middle line on the upper ſide of the tranſom in the body-plan, *fig. 2*, and level it out till it interſects the cant-fashion-piece. Then apply the ſtock of the bevel on the line levelled out, and the tongue to the cant-fashion-piece, as at B. This gives the bevelling for the end of the wing-tranſom, when cut off. But the bevel muſt be lifted up as much as the wing-tranſom rounds down at the end, and appears out of winding with a batten kept well with the middle of the wing-tranſom.

The ſame muſt be alſo done for the bevelling at the end of the filling and deck-tranſoms.

The points where the tranſoms under the deck-tranſom in the body-plan, *fig. 2*, interſect the cant-fashion-pieces, are the proper ſtatements to be croſſed on the fashion-piece mould. And

where the lines (before mentioned) levelled out intersect the cant-fashion-piece, is the proper station of the wing, filling, and deck-transoms on the fashion-piece mould for the moulding edge, but not for the direction in which those transoms strike the fashion-piece, because of the round of those transoms; which will be more explained in the following method.

When the lower sides of the transoms are laid off, it is but little trouble to make a slight mould to counter-mould the under sides of all the transoms, by making it only to one arm of the transoms, and then canting it over, to mould the opposite arm. Then, when the breech of the transom is trimmed to the bearding-line, set off the distance from the middle line each way, as far as the bearding-line *cc* is from the middle line in the plan of the transoms, *fig. 3*, to which the transom-mould is made. Then trim the end of the transom square, and set off the bevelling for the end of the transom; then cant the transom over, and applying the mould made for the under side to the breech and bevelling at the end, you have the transom counter-mould, without the assistance of any other bevelling; or they may be set off, to see if they agree with the mould; and if they do, you may be then sure the work is correct.

To Lay-off the Transoms when canted.

The utility of canting the transoms is, that it greatly assists the conversion of timber, is better for fastening the plank of the bottom, and bolts square to the stern-post. When the transoms have a very great bevelling, it is difficult at the upper edge to get sufficient fastening for the planks, which sufficiently points out the utility of canting them: proceed therefore to the operation, which will require the reader's particular attention; as those minute particulars which cannot so conveniently be displayed on the plate, can only be explained in words.

Dispose of the transoms in the sheer-plan, *fig. 4*; let the wing and filling-transoms be placed level, and the upper side of the deck-transom to the proper hang of the deck; and the other transoms below at the fashion-piece, as much above a level as represented in the sheer-plan, *fig. 4*; so as to make them nearly of an equal opening at the stern-post, and likewise at the fashion-piece. These shew the disposition of the transoms at the middle line.

Now proceed to shew the level view of the moulding edges of all the transoms in the body-plan in the following manner: the wing-transom *a*, and the filling *c*, lying level, they form a segment of a circle in the body-plan, *fig. 5*, to their given round-up. This is the proper curve to which the round-up mould is made for siding these transoms, as before observed. The next is the deck-transom *d*, which being confined to the hang of the deck, and the round of the beam, is the most difficult of any, if executed in a proper manner: it ought to undergo the following operation. The ticked line *H*, in the sheer-plan, *fig. 4*, is the under side of the deck at the middle line, and is intended to be the upper side of the deck-transom at the middle line. Transfer the heights of the ticked line *H*, or upper side of the deck-transom, in the sheer-plan, *fig. 4*, at every square timber, to their corresponding timbers in the body-plan, *fig. 5*; and where the deck at the middle line in the sheer-plan, *fig. 4*, intersects the buttock-lines, transfer them to their corresponding buttock-lines in the body-plan, *fig. 5*: a batten pinned to those spots shews the intersection of the deck at the square timbers, as *H*, in the body-plan, *fig. 5*, supposing the deck had no round-down at the side. Under the line *AA*, for the upper side of the keel, in the body-plan, *fig. 5*, mark the round-up of the gun-deck beam *R*;

and where the ticked line *H* for the deck, at the middle line, in the body-plan, *fig. 5*, intersects the square timbers, square them down to the round of the deck *R*, under the body-plan. The timbers and the buttock-lines are there marked and numbered in the same manner with those from which they were squared down. Take the distance at each place on the round of the deck, under the body-plan, *fig. 5*; square up to the line *AA*, or upper side of the keel (which is the round of the deck at each timber), and set them down below their corresponding timbers, in a perpendicular direction, from the intersection of the deck at the middle line with the square timbers *H*, in the body-plan, *fig. 5*; and from those spots direct them towards the middle line *M*, parallel to the round of the deck under the body-plan, till they intersect the square timbers, which are the proper stations on the square timbers the curve *I* of the deck will make, supposing it to be continued to the outside of the timbers; which is required, in order to find the exact form of the moulding edge of the deck-transom.

Let the buttock-lines in the body-plan, *fig. 5*, be continued down to the round of the deck *R*, under the body-plan; then take the round of the deck at each buttock-line, and set it down below the deck at the middle line *H*, in the sheer-plan, *fig. 4*, on their corresponding buttock-lines, and transfer these spots to the buttock-lines in the body-plan, *fig. 5*; then to those spots on the buttock-lines, and those on the timbers, pin a batten, and it will shew the curve the deck-line at the side will make, if continued to the outside of the timbers, as *I*, in the body-plan, *fig. 5*.

To find the deck at the side in the sheer-plan, *fig. 4*, take the heights at every square timber in the body-plan, *fig. 5*, where they intersect the deck at the side, and transfer them to their corresponding timbers in the sheer-plan, *fig. 4*: by pinning a batten to these spots, with those made before on the buttock-lines, you have the deck at the side, as *I*, in the sheer-plan, *fig. 4*, which is the level view of the moulding edge of the deck-transom.

To find the lower side of the deck-transom in the sheer-plan, *fig. 4*, and likewise in the body-plan, *fig. 5*; this should be done in the same manner as the upper side. If it is intended to be very correct, run the ribband-lines, which will be a proof to the rest of the work, in laying-off the transoms.

To find the level view of the transoms below the deck, in the body-plan, *fig. 5*, observe where the lower and upper sides of the transoms in the sheer-plan, *fig. 4*, intersect the buttock-lines, square timbers, and fashion-pieces; transfer those heights to the body-plan, *fig. 5*, on their corresponding lines, which give the level view of the transoms in the body-plan, *fig. 5*.

To lay-off the cant-transoms, proceed, as before, to make a separate plan, as *fig. 6*. The moulding edges of the wing, filling, and deck-transoms, are laid off so similar to the former, as not to need repeating here. But should the deck-transom have much sheer, and a great round, it would be a further proof of correctness, to take the distance from the perpendicular line *P*, in the sheer-plan, *fig. 4*, to timber 32, in the direction of the sheer of the deck *I*, and set it off square from the line *PP*, in the plan of the transoms, *fig. 6*, which will be further forward than the said timber, as before laid off; then pin a batten to the round of the deck under the body-plan, *fig. 5*, marking the middle line, and the spot that was squared down from the deck at the side, at timber 32, to the round of the deck, and set it off on the new timber 32, in the plan of the transoms, *fig. 6*. This would give the exact spot on timber 32, if the deck was required to hang and round to extremes, in the same manner

as by pinning a batten to the round of the wing and filling-transfoms in the body-plan, *fig. 5*, and marking the square timbers, buttock-lines, and square fashion-pieces on the batten; then let the batten lie straight, and it will be the exact half-breadth at every square timber, buttock-line, and fashion-piece, and will give the exact length of the wing-transfom.

To lay-off the transfoms under the deck, take the distance from the line P, in the sheer-plan, *fig. 4*, to the buttock-lines in the direction of the transfoms, and set them off from the line P P, in the plan of the transfoms, *fig. 6*, on their corresponding buttock-lines. Take the half-breadths in the body-plan, *fig. 5*, square from the middle line to the intersection of the transfoms Nos. 1, 2, 3, 4, 5, and 6, with the square fashion-piece, and set them off square from the middle line in the plan of the transfoms, *fig. 6*, to intersect the fashion-piece, marking a line parallel to the middle line, as *a a*, transfom No. 6. Then take the distances from the line P, in the sheer-plan, *fig. 4*, in the direction of the transfoms, to the fashion-piece, and set them off square from the line P P, in the plan of the transfoms, *fig. 6*, on the lines *a, a*, at the intersection of the fashion-piece. Take the half-breadths square from the middle line in the body-plan, *fig. 5*, where the transfoms intersect square timber 36, and set them off square from the middle line, in the plan of the transfoms, *fig. 6*. Then take the distances from the line P, in the sheer-plan, *fig. 4*, to square timber 36, in the direction of the lines of the transfom, and set them off square from the line P P, in the plan of the transfoms, *fig. 6*, to intersect their several half-breadths, as at *b, c, d, e*. In the same manner proceed to find all the spots for the square timbers, in order to prove the buttock-lines. This will give the exact form of the moulding edge of all the transfoms below the deck, and the station of the fashion-piece on the transfom, with the length of the transfom at the moulding edge.

To find the direction of the end of the transfom, to lie against the side of the fashion-piece, observe in the half-breadth plan where the fashion-pieces intersect the middle line, and square them up to the sheer-plan, as may be seen ticked, and marked K, M, L, calling them the fashion-pieces at the middle line in the sheer-plan, *fig. 4*. Take the distance from the line P, in the sheer-plan, *fig. 4*, to the middle line of the aftermost fashion-piece K, in the direction of the transfoms No. 6, and set it off from the line P P, in the plan of the transfom, *fig. 6*, on the middle line, and mark the ticked line *g g*, from the spot on the middle line, to the spot on No. 6. transfom. This will give the direction to cut off the end of the transfom, in order to lie against the side of the fashion-piece.

To bevel the Transfoms when canted.

Those transfoms which are not sided straight, as the wing, filling, and the deck, are generally bevelled by the buttock-lines, as before observed; but rather than trust to the bevellings only (it being rather difficult to apply them so truly as they should be), lay-off the under sides of all the transfoms, and make a slight mould to them. This will correct the bevellings, and make greater dispatch in trimming the transfoms. Then there need only (except for proof sake) be taken the bevelling at the bearding-line, and the bevelling at the end; for the mould will give the rest. But observe to be careful in the bevellings at the ends of the transfoms; for instance, the ends of the wing and filling-transfoms, when they lie level, are to be cut off square; but keep the square as much above the end of the wing and filling-transfoms, as they round in their length, and let

the square look out of winding with the middle of the transfom. Also the bevel (when applied on the end after it is cut off, in order to bevel the end for counter-moulding) must be kept as much above the end of the transfom, and look out of winding with the middle of the transfom.

As the bevelling for the end of the deck-transfom is taken against the cant-fashion-piece by a level line in the body-plan, *fig. 5*, it must be observed how much the transfom at the middle line in the sheer-plan, *fig. 4*, is below a level (suppose one foot). Then place a batten at the middle line on the transfom, and lift the foremost end of the batten up till it becomes level, as supposing the transfom to be in its place: then proceed with the square and the bevel for the end of the transfom, in the same manner as for the wing and filling, looking out of winding with the batten at the middle line.

To bevel the transfoms, which are canted in the sheer-plan, *fig. 4*, proceed in the same manner as in bevelling the cant-timbers, by making a parallel line to the moulding edge. Therefore lay-off the bevellings of the transfoms, by squaring a line from the upper side, where it intersects the line P, in the sheer-plan, *fig. 4*, to the under side, as the ticked line *a* at the lower transfom. Take the distances from where the squared line, *a*, crosses the lower edge in its cant direction, to the bearding-line *c*, and to all the buttock-lines, and set them off square from the line P P, on their corresponding lines, in the plan of the transfoms, *fig. 6*. Where the bearding-line *c*, in the sheer-plan, *fig. 4*, proves to be square from the direction of the transfom, as it is, or very nearly so, at the lower transfom, then the bearding for the moulding edge, and likewise for the bevellings, will come as near together in the plan of the transfoms, *fig. 6*. This may sufficiently prove that the method of bevelling is correct.

Where the under side of the lower transfom intersects the square timbers and square fashion-piece in the body-plan, *fig. 5*, take the nearest distances from thence to the middle line, and set them off square from the middle line, in the plan of the transfoms, *fig. 6*, striking lines parallel to the middle line, as at *i i*. Then take the distances from the squared line *a*, in the sheer-plan, *fig. 4*, in the direction of the under side of the lower transfom, to the square timbers and fashion-piece T, and set them off square from the line P P, on their corresponding lines last struck, in the plan of the transfoms, *fig. 6*. To these spots, and those on the buttock-lines, pin a batten, and it will represent the ticked line, *b b*, within the lower transfom, which will shew how much the lower transfom is under from a square, agreeable to the depth of the transfom. Take the distance from the squared line *a*, in the sheer-plan, *fig. 4*, to the ticked perpendicular K, which is the after-fashion-piece at the middle line; and set it off from the line P P, on the middle line, in the plan of the transfoms, *fig. 6*, and mark the ticked line, *m*, from thence to the spot on the fashion-piece, which will be a line parallel to the ticked line *g*, before marked to cut off the end of the transfom; and the distance between the two ticked lines shews how much the end of the transfom is under from a square, agreeable to the depth of the transfom.

The ticked line *b b*, in the plan of the transfoms, *fig. 6*, which is for the bevellings, is the line to make the temporary mould to, in order to counter-mould the transfom; and by cutting off one end of the mould to the thwartship-line for the breach of the transfom, and cutting off the others to the ticked line *m* for the end of the transfom, when the mould is applied to the under side of the transfom, it will be easily perceived if the work be true.

To find the exact bevelling to be applied over the end

of the tranfom, after the end is cut off, in order to counter-mould the tranfom, proceed in the following manner. Where the upper and lower fides of the lower tranfom interfeet the after-cant-fashion-piece P, in the body-plan, *fig. 5*, level them out to interfeet the after-cant-fashion-piece O. Where the upper fide of the lower tranfom interfeets the perpendicular ticked line K (which is the after-fashion-piece in the sheer-plan, *fig. 4*), transfer that height to the middle line, in the body-plan, *fig. 5*; and from thence draw a ftraight line to the upper fide of the lower tranfom, on the cant-fashion-piece, as the ticked line *e*; to which line fix the flock of a bevel, as at B, and the tongue to the cant-fashion-piece O, as low down as the fpot for the lower fide of the tranfom. This is the proper bevelling to be applied on the end of the tranfom, after the end is cut off, in order to counter-mould the tranfom. The ticked line *e*, to which the flock of the bevel is placed, is the direetion of the tranfom to be croffed on the fashion-piece mould. The bevel B, which is represented in the body-plan, *fig. 5*, fhewing the bevelling of the end of the lower tranfom, fufficiently proves the utility of canting the tranfoms; for, by having fo little bevelling, it greatly affifts the converfion of timber, as well as that it muft certainly be better for the fecurity of the plank of the buttock.

To Lay-off a Square-Tuck, Plate IX. Laying-off C.

We have already explained the utility of the tranfoms in compofing the ftern-frame, by which method moft fhips are inclofed abaft. But yachts and cutter-built veffels are, owing to their clearnels of run abaft, inclofed by a fquare tuck, by which room is gained; and, when properly put together, this mode of conftruction is, perhaps, ftronger than tranfoms would be in veffels of this defcription.

The tuck propofed to be laid off is that of the royal yacht, *Plate XIII*. But that the reader may be led progressively on from the eafieft to the moft difficult part of the operation, we fhall firft propofe a fquare tuck, the fides of which are to be out of winding, or in the fame direetion as the rabbet of the poft, in confequence of which the wing-tranfom muft be ftraight athwartfhips, and the whole will be one flat furface (fimilar to the tranfoms of boats), or a feetion of the vefel cut athwartfhips, but not in a perpendicular direetion, which is the only difference between it and the fquare timbers; and as the feetion is agreeable to the rake of the ftern-poft, it confequently follows, that the laying it off muft differ from the fquare timbers in the operation.

The horizontal view of the tuck muft firft be represented in the body-plan, *fig. 8*, which is done in the following manner: ftrike a horizontal line in the sheer-plan, *fig. 7*, at the height of the wing-tranfom at the fide, as at 5; and likewise as many horizontal lines below that as may be thought fufficient; and where they interfeet the aft-part of the rabbet of the poft *aa*, fquare them down to the half-breadth plan, *fig. 9*; then transfer their heights to the body-plan, *fig. 8*; and where they interfeet the fquare timbers 21, 22, 23, 24, 25, and P I, in a horizontal direetion, take thofe diftances from the middle line, and fet them off upon their corresponding timbers from the middle line, in the half-breadth plan, *fig. 9*; then by pinning a batten to thofe fports, the horizontal lines 1, 2, 3, 4, 5, and 6, will be represented; then take their diftances from the middle line, in the half-breadth plan, *fig. 9*, where they interfeet the lines squared down from the sheer-plan, and fet them off from the middle line on their corresponding horizontal lines, in the body-plan, *fig. 8*; then by pinning a

batten to thofe fports, the horizontal view of the tuck, *a*, will be represented in the body-plan, *fig. 8*, as high as the wing-tranfom at the fide. But was the head of the fashion-piece required to run up, to take a bolt or two through the heel of the fide counter-timber, proceed in the fame manner to run a horizontal line or two above that at the fide of the wing-tranfom; fay, one at the upper fide of the wing-tranfom at the middle line; then run the main half-breadth line in the half-breadth plan, *fig. 9*; then, where the laft horizontal line and main height of breadth line interfeet the aft-fide of the rabbet *a*, in the sheer-plan, *fig. 7*, fquare them down to the half-breadth plan, *fig. 9*, and take their diftances from the middle line in the half-breadth plan, *fig. 9*, to where they interfeet the horizontal line 6, and the main half-breadth line, and fet them off from the middle line on their corresponding horizontal lines, in the body-plan, *fig. 8*; then by continuing the curve, *a*, upwards through thefe fports, the horizontal view of the tuck will be continued up to the height of breadth.

Now, where the horizontal view of the tuck in the body-plan *a*, *fig. 8*, interfeets the bearding-line *b*, take that height, and transfer it to the sheer-plan, *fig. 7*, ftriking there the horizontal line S, which represents the feating of the tuck; then take the diftance from the feating of the tuck, in the sheer-plan, *fig. 7*, on the rake, (in the direetion of the rabbet of the poft *a*), to the refpective horizontal lines and height of breadth, and fet them up the middle line, from the horizontal line S, at the feating of the tuck, in the body-plan, *fig. 8*; ftriking a horizontal line to the rake, at every height, as fhewn by the fine-ticked lines; then, where the horizontal view of the tuck, *a*, interfeets the horizontal lines firft ftruck, carry it up parallel to the middle line, to their corresponding horizontal lines on the rake; which will give the fports through which the fine-ticked curve is to pafs, that will represent the proper fhape of the tuck, agreeably to the rake, as *c*; and the line to which the fashion-piece mould muft be made.

The bevellings for the fashion-piece may next be taken, by proceeding as follows. The aft-fide of the rabbet of the poft *a*, in the sheer-plan, *fig. 7*, represents the aft-fide of the fashion-piece of the tuck; therefore, take the fiding of the fashion-piece, and fet it off afore the rabbet, and fquare thereto; then, by ftriking a parallel line to the aft-fide *a*, the fore-fide of the tuck *b* will alfo be represented; next, from the feating of the tuck S, on the aft-fide, fquare the line C from the rabbet to the fore-fide; and from its interfeetion at *c*, take the heights of the horizontal lines up the fore-fide, and fet them up on the middle line from the horizontal line S, at the feating of the tuck, in the body-plan, *fig. 8*; ftrike horizontal lines for the fore-fide of the fashion-piece, as diftinguifhed by the long-ticked lines; then, where the fore-fide of the fashion-piece *b*, in the sheer-plan, *fig. 7*, interfeets the horizontal lines and height of breadth, fquare it down to their corresponding horizontal line and main half-breadth, in the half-breadth plan, *fig. 9*; at which interfeetions take the diftances fquare to the middle line, and fet them off from the middle line on their corresponding horizontal lines, for the fore-fide of the fashion-piece, in the body-plan, *fig. 9*. Continue the fore-fide of the fashion-piece down to the bearding-line *d*, as you fee ticked in the sheer-plan, *fig. 7*; then take the diftance from the interfeetions of the fquared line at the feating *c*, down the fore-fide of the fashion-piece to the horizontal line 1, and where it interfeets the bearding-line *d*, and fet it off in the body-plan, *fig. 8*. Below the horizontal line S, at the feating of the tuck down the bearding-line, ftrike a horizontal line for No. 1, and proceed as before direetted to obtain the half-breadth

breadth spot on the half-breadth and body-plans, *figs. 9* and *8*; then to all those spots pin a batten, and mark the curve which shall intersect the bearding-line, and the fore-side or bevelling-edge, *d*, of the fashion-piece will be represented in the body-plan, *fig. 8*.

The aft-side and fore-side appear now in their proper shape, in the body-plan, *fig. 8*, and of the same form as the fashion-piece, when trimmed and laid flat with the aft-side upwards, as then both edges will be seen, in consequence of its being a standing bevelling; therefore, the distance from the line represents the aft-side to the line of the fore-side, taking the nearest distance, as at *e*, which will shew how much the bevellings are standing, or without a square, in the breadth of the bevelling-board, which should be equal to the siding of the fashion-piece.

When the mould is made to the ticked line, *c*, of the aft-side, the heel of it must be cut off well with the line for the seating of the tuck, and likewise well with the middle line, in order that it may dovetail and bolt into the stern-post. Mark also on the mould the bearding-line, or side of the inner post. The different firmarks for the ribbands must be marked on the moulds; but, in order that the stations of the ribbands may be correctly marked, observe where the diagonal lines intersect the horizontal view of the tuck *a*, in the body-plan, *fig. 8*, and carry them up parallel to the middle line, to the line for the aft-side of the fashion-piece *c*, to which the mould is made. This will be their proper stations or upper sides, and may thence be marked on the mould.

The bevellings may be taken at the different firmarks or ribbands, and set off where taken, as the bevel at the seventh ribband, which will shew it more clearly. The ticked line *g*, drawn parallel to the stock of the bevel, is the same distance from the outside of the bevel, as the fashion-piece is sided. Then draw a line square from the stock of the bevel to the ticked line *g*; and where it intersects the ticked line *g*, as at *b*, set off from *b* to *i* the same distance as the fore-side is from the aft-side at that place, as before directed, and open the tongue of the bevel to *i*. This will shew the bevelling of the fashion-piece at that place. The bevel is to be applied square from the moulding edge.

Run in the half-breadth plan, *fig. 9*, the diagonal *7*, although the ending of it only differs from those explained before, and need only be described. Transfer the height from the body-plan, *fig. 8*, where the diagonal *7* intersects the horizontal view of the fashion-piece *a*, and set it up in the sheer-plan, *fig. 7*, at the aft-side of the fashion-piece; and from its intersection there, square it down to the half-breadth plan, *fig. 9*; then take its distance in the body-plan, *fig. 8*, from the middle line to the horizontal view of the fashion-piece *a*, in its diagonal direction, and set it off from the middle line, in the half-breadth plan, on the line squared down, which gives its ending at the fashion-piece. In the same manner transfer its height where it intersects the upper side of the wing-transom, in the body-plan, *fig. 8*, and set it up in the sheer-plan, *fig. 7*; and where it intersects the aft-side of the fashion-piece, square it down to the half-breadth plan, *fig. 9*; then take the distance from the middle line, in the body-plan, *fig. 8*, as before, to the upper side of the wing-transom, and set it off from the middle line, in the half-breadth plan, *fig. 9*, on the line last squared down; then mark a line through those spots, as the long-ticked line *a*, in the half-breadth plan, *fig. 9*, which will be the true ending of the diagonal *7*, or any diagonal crossing the wing-transom and fashion-piece.

Square tucks of lighters are like those above described,

and the transoms of boats are laid off in a similar manner, but composed of only one piece athwartships, and their upper side is bounded by the upper side of the sheer. But the tucks of yachts (or frigates, if built of fir) partake of the round-forward of the wing-transom, which causes the fashion-pieces to take a part of it also the whole of their length, which makes them rather more difficult to be laid off. But, supposing the former to be clearly understood, we shall give a description of a tuck, the outside of which is to round-forward, in its finished state.

Suppose a flat surface, of thin deal (in length from the head of the fashion-piece or height of breadth to the seating of the tuck, and in breadth to the outside of the transom) was placed with one edge to the rabbet of the post, and the other edge bent round to a curve, as much as the outside of the tuck is intended to round-forward, in which position suppose it to be confined; then draw the shape of the outside of the tuck or fashion-piece down to the post, and cut it out. The true shape of the tuck or fashion-piece is now shewn as it is to be trimmed, and as it will appear in its finished state. Then take it from its position, and lay it flat, letting the round be unconfined; and it will then appear as it is required to be laid off in the body-plan, in order to make the mould therefrom.

The fashion-pieces for the square tuck being already laid off, the same horizontal lines, &c. may be transferred to the sheer and body-plans, *figs. 10* and *11*; then proceed to lay it off upon the flat, agreeable to the rake of the rabbet of the stern-post, as before directed, with this difference, having no round-aft made, but one straight line in the thwartship view, in the sheer-plan, *fig. 7*, which was the aft-part of the rabbet of the stern-post; but, in the present square tuck, where the head of the fashion-piece is carried forward, to connect with the end of the wing-transom, the moulding edge of the fashion-piece forms a serpentine line.

Therefore, where each horizontal line intersects the aft-part of the rabbet of the post *a*, in the sheer-plan, *fig. 10*, square down the distances to the middle line of the half-breadth plan, *fig. 12*, making of spots; then upon the horizontal line, No. 5, at the height of the wing-transom, at the side, set off from the aft-side of the rabbet of the post *a*, the round-forward of the wing-transom, in the sheer-plan, *fig. 10*, and square it thence down to the half-breadth plan, *fig. 12*; upon which set off the half-breadth of the wing-transom, and thence sweep a curve, the centre of whose radius being in the middle line, shall cut the spot for the said horizontal line, in the middle line of the half-breadth plan, *fig. 12*, which will represent the aft-side of the wing-transom *a*, at the height of the horizontal line at the side. Now, from the other spots squared down on the middle line of the half-breadth plan, sweep curves with the same radius, and they will be parallel to the curve of the wing-transom *a*. The horizontal lines being transferred from the half-breadth plan, *fig. 9*, to *fig. 12*, take the distances square from the middle line in the half-breadth plan, *fig. 12*, to where the horizontal lines intersect their respective curves for the aft-side of the tuck, and set them off from the middle line on their corresponding horizontal lines, in the body-plan, *fig. 11*; a batten pinned to those spots will shew the horizontal view of the tuck *a*, in the body-plan, *fig. 11*. Also, where the horizontal lines in the half-breadth plan, *fig. 12*, intersect their respective curves, square the distances up to their corresponding horizontal lines in the sheer-plan, *fig. 10*; and by drawing a curve to pass through those spots, the thwartship view of the aft-side of the fashion-piece, *b*, will be represented in the sheer-plan, *fig. 10*; and what the thwart-

SHIP-BUILDING.

thwartship view of the aft-side of the fashion-piece leaves the rabbet of the stern-post, in order to be conformable to the wing-transom at the side, is easily perceived by the shaded lines.

Still this thwartship view of the aft-side of the fashion-piece, *b*, be shewn in the sheer-plan, *fig. 10*, the ribband-lines cannot be truly ended, although the operation is the same as before described.

Though the aft-side of the fashion-piece *b*, in the sheer-plan, *fig. 10*, leaves the rabbet of the stern-post at the head conformable to the end of the wing-transom, yet a square line at the seating must be drawn as before, to lay-off the tuck on the flat; therefore, take the nearest distances from the square line *a*, in the sheer-plan, *fig. 10*, to where each horizontal line crosses the aft-side of the fashion-piece *b*, and set them up from the horizontal line *S*, in the body-plan, *fig. 11*, striking horizontal lines, as distinguished by a fine tick.

Then take the half-breadth of the wing-transom, in the body-plan, *fig. 11*, square from the middle line, and set it off from the middle line, on the line *A A*. Next, fix one leg of the compasses at the end of the wing-transom, in the sheer-plan, *fig. 10*, and take the nearest distance to the aft-part of the rabbet of the stern-post *a*, which is square from the rabbet, as the line *c*; and set it off square from the line *A A*, at each end of the transom *bb*; and sweep the arc *cc*, which gives the round-aft of the tuck at any height, square from the rabbet of the stern-post. Square down the fine-ticked lines, or horizontal lines, 2, 3, 4, 5, 6, and 7, on the rake where they intersect the horizontal view, *a*, of the fashion-piece in the body-plan, *fig. 11*, to the round-aft line, on a square under the body-plan. Then take their distances from the middle line, on the curve *cc*, or round-aft, on a square, and set them off from the middle line of the body-plan, *fig. 11*, on their corresponding horizontal lines; then pin a batten to these spots, and to where the seating intersects the post, and it will give the form of the aft-side of the fashion-piece *d*, to which the mould is to be made, that will agree with the other timbers, when in their places.

To be correct with the length of the wing-transom on the flat, take the half-breadth from the body-plan, *fig. 11*, on the round for the upper side of the transom; then continue the end of the transom in the half-breadth plan, *fig. 12*, square out from the middle line, as at *c*; on which (square from the middle line) set off the half-breadth taken on the round from the body-plan, *fig. 11*, and from that spot sweep an arc to break into the middle of the transom, at the middle line, as represented by the dotted line *a*; then from the before mentioned spot, or end of the wing-transom at *b*, take the half-breadth round the dotted curve to the middle line, and set it off from the middle line in the body-plan, *fig. 11*, round the curve, for the upper side of the transom. This will give the exact length of the transom on the round-aft of the tuck.

Previous to the laying-off of the fore-side of the fashion-piece, it will be proper to understand in what manner the fashion-piece is to be moulded and trimmed, particularly on the fore and after-sides.

Make a mould to the moulding, or outer edge of the fashion-piece laid off on the flat, as the fine ticked line *d* in the body-plan, *fig. 11*. The upper end may be made as high as the height of breadth, or horizontal line 7, and the lower end may reach to the seating on the post. Let the upper end of the mould be cut off well with the direction of the horizontal line 7, and let the heel be exactly perpen-

dicular at the side of the inner post. Make another mould to the round-aft, on a square *cc*, as shewn under the body-plan, *fig. 11*, and of a parallel breadth, like part of a beam-mould. Make it as broad as the fashion-pieces are intended to be sided, and let the midship-end be well with the side of the inner post, and cut off parallel to the middle line. Let the side-end correspond well with the moulding edge of the fashion-piece, and cut off agreeable to the round of the side when the mould lies in its proper place, underneath the body-plan, *fig. 11*. Let the fashion-piece be sided sufficiently for the wing-transom to dovetail into the aft-side of it, and let the fore-side of the fashion-piece, that runs above the wing-transom, be of sufficient length to receive the bolts of the side stern-timber, and long enough at the heel to meet at the middle line.

When the fashion-piece is roughly sided on the aft-side, so as to lay the mould on the aft-side, to mark the upper and lower end nearly, then cut off the head by the mould for the thwartship-way, and the fore and aft-way, square. Then fasten the round-aft mould, that is made to the siding, on the head of the fashion-piece, by which may be trimmed the fore and after-sides of the fashion-piece out of winding, by lines parallel to the middle line. Thus will you have the best opportunity of seeing how to convert the piece, by seeing both sides at once. Then will the fashion-piece be of a parallel thickness from one end to the other, by all lines that are parallel, whether perpendicular or horizontal.

To Lay-off the Fore-side of the Fashion-Piece.

Having the siding of the fashion-piece on a square, set it off in the sheer-plan, *fig. 1*, square from the rabbet of the stern-post *a*; then with compasses take the siding of the fashion-piece in the direction of the horizontal lines, and set it off square from all the aft-sides of the horizontal lines, prolonged in the half-breadth plan, *fig. 12*, on each horizontal line, and square them up on their corresponding lines in the sheer-plan, *fig. 10*. Then pin a batten to those spots, and the fore-side of the fashion-piece *c* will be represented. Take the heights above and below the squared line *d*, in the sheer-plan, *fig. 10*, to the intersection of each horizontal line with the fore-side of the fashion-piece *c*, in the same manner as the aft-side was done; and set off above and below the ticked line *S*, in the body-plan, *fig. 11*, and strike horizontal lines, as there distinguished by long-tick. Then take the half-breadths in the half-breadth plan, *fig. 12*, to the fore-side of the fashion-piece on the horizontal lines, square from the middle line; and set them off square from the middle line on to the line for the round-aft, on a square *cc*, under the body-plan, *fig. 11*. Then take them off again on the round-aft line, and set them off from the middle line, on their corresponding horizontal lines in the body-plan, *fig. 11*. Then pin a batten to those spots, and the form of the fore-side of the fashion-piece *e* will be agreeable to the siding proposed.

The aft-side of the fashion-piece not being straight, will render it more troublesome than useful, to run lines in order to trim the outside of the fashion-piece by bevellings; therefore it would be better to make a mould to the fore-side *e*, and trim a spot to lay to the side of the inner post or dead-wood; and set off a bevelling for the outside at the main-breadth, as at *B*, *fig. 12*.

Mark the line at the seating *S*, in the body-plan, *fig. 11*, on the mould for the aft-side, and on the mould for the fore-side; and when the aft-side is moulded, and the side trimmed to lay to the inner post, mark the spot *b* square from the aft-side

aft-side to the fore-side, to which place the spot *b*, on the mould for the fore-side, must properly correspond; and the head of the mould must be kept well with the spot to the bevelling at the main-breadth. The mould lies then in its proper place to mould the fore-side of the fashion-piece.

It is customary, in boats, for the planks of the bottom to run through to the aft-side of the transom, and sometimes to the aft-side of the fashion-piece of lighters; but in larger vessels it is better to rabbet the fashion-piece; for when the planks of the bottom are rabbetted into the fashion-piece, and the inside of the butts left longer than the outside, the planks are apt to be pressed to the timbers on caulking their ends; while, on the contrary, when the planks run through the fashion-piece, they are not able to bear the force that is required to be made by caulking their ends sufficiently. In vessels of this class, likewise, the ends of the planks would be liable to be started off by accident.

The fashion-piece, as it is laid off, both fore and aft-sides, is conformable to the timbers of the body, being for that reason easier understood; but when the fashion-piece is moulding, be careful to leave enough without the lines for the thickness of the plank; which may be found exactly by holding a batten at the outside of the fashion-piece, at several places, parallel to the lines for the fore and aft-sides of the fashion-piece, and square from the lines.

Then extend the compasses to the thickness of the bottom plank, or otherwise run as many fictitious diagonal lines as shall be necessary, and square from the moulding edge of the fashion-piece. Then set off the thickness of the plank of the bottom, and lay off the extreme outside of the fashion-piece, likewise the aft-side, observing the round in the direction of the diagonal line, whereby a mould may be made to the aft-side, at the extreme breadth; and the outside may be trimmed by bevellings from the diagonal lines. But great care must be taken to place each diagonal line square from the moulding edge of the fashion-piece; and then, as the fashion-piece at the aft-side will wind or twist in the direction of the diagonal lines, the tongue of the bevel may not cant at all the bevelling spots, exactly in the direction wherein the diagonal lines were laid off; for the diagonal lines at the middle line (suppose in the sheer-plan) are parallel to the upper side of the keel; and are canted down similar to the flap of a table, as before observed; in which direction the tongue of the bevel ought to cant, when the bevellings are taken from the diagonal lines.

The fashion-pieces are rabbetted on their aft-sides, to receive the planks of the tuck; but do not take the rabbet so low down as where it intersects the post, but leave it square some inches above it, that the midship piece may be gotten in its length as it rabbets into the post, and it will also leave a better butt for caulking, as shewn in the body-plan, *fig. 11*.

The wing-transom mould must be made to the fine ticked curve *d*, in the half-breadth plan, *fig. 12*. The bevelling of the wing-transom will be the same athwartship on the aft-side, which bevelling is the rake of the rabbet of the post *a*; and the wing-transom is rabbetted at the aft-side at the lower edge for the planks of the tuck, and at the upper edge for the planks of the lower counter, (if thought proper,) therefore the heels of the stern-timbers should be placed as much before the aft-part of the wing-transom as the thickness of the planks of the lower counter.

To prevent any error in the true height of the fashion-pieces, let the firmark *e*, in the body-plan, *fig. 11*, be correctly marked on the mould and side of the stern-post, so

that when the heels of the fashion-pieces are letting-on the post, those firmarks must exactly agree.

To Lay-off the several Parts of the Head, Plate X. Laying-off D.

The knee, cheeks, rails of the head, and block for the figure, must be laid off to their full size on the floor from *Plate I.*, which is the horizontal and thwartship view, when the cheeks, rails, &c. are fixed in their places.

To make the Mould to the Knee of the Head.—The lower part of the knee at the scarf, as at *X, Plate X. fig. 1, Laying-off D.*, may be made of fir-board about an inch thick, and up the fore-part of the knee and stem, as high as the cutting-down and seating of the figure; but these need be no broader than about five inches for lightness, as at *39, 39, fig. 1*. Then across the mould are fastened battens, which not only keep the mould together, but the manner of siding the knee is expressed thereby. Thus, take any perpendicular, as at *24, fig. 1*, and level out the several heights *13, 14, 15, 16, and 17*; and at *13 and 17* set off the half-siding of the stem, striking a line thereto. Then let fall a perpendicular from the fore-side of the knee at the upper part, as at *25, fig. 1*, and set off the half-siding of the knee at *4*, and at *12*, and strike a line. Strike the lines across the knee of the head, where it is intended to have the upper side of the battens, as at *1, 2, 3, &c. to 12*. Then, to determine on the siding of the knee at the fore part, pin a batten from the upper part of the knee round the fore-side, marking thereon the lines *1, 2, 3, &c.* Then apply the batten to the perpendicular *25, fig. 1*, keeping it fast at the upper end, and mark on the perpendicular the spots *1, 2, 3, &c.* Then from the perpendicular *25, fig. 1*, take the half-siding at each spot, and set them off on their corresponding lines at the fore-side of the knee: proceed in the same manner for the half-siding of the stem at *24, fig. 1*, and strike in the lines as ticked across the knee. Then battens being made to those lines, and nailed across the mould, the half-siding of the knee may be readily set off at the upper side of each batten, and the knee, when put together, may be trimmed straight from the fore-side to the stem or aft-side of the knee: the cutting-down, as at *1, 2, 3, and 4, fig. 1*, is sided in the same manner.

To make the Mould to the Gripe, G, fig. 1.—The gripe is only the completion of the knee to the keel, and the mould is made so similar to the knee above as to need no further description.

To make the Moulds to the Cheeks.—The cheeks must be laid off to their moulded size on the half-breadth plan, *fig. 2*, as at *C, C*, to the main half-breadth line, allowing the thickness of the plank, as at *R*, and against the side of the knee. Another mould must be made to the flight of each cheek, in the sheer-plan, *fig. 1*, at *C*, or upper cheek; and *L C*, the lower cheek, from the heel of the figure *Z*, to reach as far aft as the cheeks are there shewn, marking a firmark at the fore-side of the stem. Then, to mould the cheeks to their proper flight, draw off the knee-arm to the mould made in the half-breadth plan, marking on the piece the fore-side of the stem from that mould: then fastening the flight-mould to the knee-arm of the cheek, observing to keep the firmark well at the fore-side of the stem, and keeping the mould parallel to the middle line, let the cheek be trimmed out of winding by the thwartship lines, or lines which are square from the mould. Then there is a certainty, when the cheek is throated, no angle will appear in the throat, as there will be sometimes by the usual method, particularly in full-bowed ships, where the sheer springs more than the flight of the cheeks. When the side-arm of the cheek is trimmed

trimmed by a mould made to the sheer of the ship, and the fore and aft-arms by the flight of the cheeks laid off on the floor, there will sometimes be a very disagreeable throat, which cannot happen when trimmed by the above method. Although the side-arm may not hang so much as the sheer of the ship, yet it will not look disagreeable, because the throat of the cheek is the only part that takes the flight.

To lay-off the Head-Rails.—Strike in the perpendiculars Z and Y from the fore-side of the figure, and foremost end of the upper rail in the sheer-plan, *fig. 1*, down to the half-breadth-plan, *fig. 2*. Determine on the half-breadth of the lacing, as at 1, 2, *fig. 2*, as the foremost end of the upper rail comes against it. The after end lays against the plank at the beak-head timber, from whence strike a straight line to the lacing at its fore end. Then set off the siding of the rail, allowing the thickness of the lining, and strike the line P, or outside; which being the fight-side of the rail when in its place, is the properest to be laid off.

Strike the horizontal line 32 at the upper part of the foremost end of the upper rail, in the sheer-plan, *fig. 1*. Then square up to the line 32 the aft-side of the stem-timber 20, and as many lines at equal distances as may be needful, and number them 1, 2, 3, &c. above the line 32, as shewn in *fig. 1*. Set off the same stations from perpendicular Y, on the middle line in the half-breadth plan, *fig. 2*, and square them out to the line P, or outside of the main-rail, numbering them, as before, at the middle line; then square them out from the line P. Take the distances from the line 32 in the sheer-plan, *fig. 1*, to the upper and lower parts of the main-rail at each perpendicular line, and set them off on their corresponding numbers in the half-breadth plan, *fig. 2*, which was squared out from the line P; and then, by pinning a batten to these spots, it will give the form of the main-rail, and it will shew the same form, when in its place, as that in the sheer-plan, *fig. 1*. Where the lines squared out from the middle line in the half-breadth plan intersect the inside of the main-rail, strike them from thence square from the line P to the rail already laid off, and take the distances on these lines from the line P to the upper part of the rail, and set them down from the line 32 in the sheer-plan, *fig. 1*, on their corresponding perpendiculars; which will give the inside of the main-rail in the sheer-plan, *fig. 1*; as the ticked line, which rises above the middle of the rail forward, being the upper line, and below towards the after end as the after part, falls below the outside. The inside of the rail at the lower edge must be set off in the same manner in the sheer-plan, in order to lay off the timbers exactly.

Strike the ticked line in the plan of the rails in the half-breadth plan, *fig. 2*, which is the line to which the chamfer at the under side of the rail the mouldings are intended to be wrought to. This must likewise be laid off in the sheer-plan, because in a thwartship view this is the proper fight of the lower edge of the rail: for the lower part of the rail in the sheer-plan (which was first laid off in order to lay off the rail to its proper cant in the half-breadth plan) may now be rubbed out, when the rail is supposed to be chamfered or wrought.

In the half-breadth plan, *fig. 2*, where the lines squared out from the middle line intersect the ticked line before-mentioned, strike them from thence square from the line P to the lower part of the rail laid off; then take the distances on those lines from the line P to the lower part of the rail, and set them off from the line 32 in the sheer-plan, *fig. 1*, on their corresponding perpendiculars. This gives the lower part of the rail in the sheer-plan, at the chamfer, being the fight part of the rail when trimmed and in its place.

Before the main-rail is canted, as in the half-breadth plan, *fig. 2*, the proper form of it cannot be ascertained in the sheer-plan, *fig. 1*; for the rail, when canted in order to make the mould, must be gradually diminished from one end to the other, and from thence transferred to the sheer-plan; for instance, the middle line at the after-part of the rail in the sheer-plan, is the aft-part of the rail at the outside; so that from thence to the fore-side of the rail shews less than the rail in the middle; also, at the foremost end the rail will not shew so much as it does in the half-breadth plan; whereas in the middle it shews the same.

Before the middle rails can be canted in the half-breadth plan, *fig. 2*, to their proper spread, proceed in the following manner; strike an horizontal line from where the aft-side of the stem-timber 20, in the sheer-plan, *fig. 1*, intersects the upper side of the upper cheek, as the line 27, in *fig. 3*. Take the heights from the upper side of the upper cheek, at the perpendicular line 7, in the sheer-plan, *fig. 1*, to the upper and lower parts of the three rails L, M, and N, and set them up from the horizontal line before-mentioned in *fig. 3*, as you see ticked at L, M, and N. Then take the distances from the middle line in the half-breadth plan, *fig. 2*, at the line 7, to the outside of the main-rail; likewise to the inside, and the ticked line for the chamfer of the rail at the under side; and set them off on their corresponding lines in *fig. 3*, and draw the thwartship section of the main-rail. Set off in the half-breadth plan the half-thickness of the knee S Y of the head, and the moulding of the upper cheek C C; then take the half-thickness of the knee at 7, or aft-side of the stem-timber in the half-breadth plan, *fig. 2*, and set it off from the middle line *u* in the plan of the timber, *fig. 3*, on the line 27. Then determine the breadth of the timber at the upper side of the cheek, and pin a batten to the curve for the outside of the timber. Then in the plan of the timber, *fig. 3*, determine on the half-breadths of the middle rails L and M; and transfer them from thence to the half-breadth plan, *fig. 2*, at the aft-side of the stem-timber. Then set off the distance of the foremost end of the rails from the middle line, and strike in the two lower or middle rails N, O, in the half-breadth plan, *fig. 2*.

The middle and lower rails being determined in the half-breadth plan, *fig. 2*, the outsides of them, being the fight-sides, are the properest to be laid off. The outside of the middle rail is marked O, and the outside of the lower rail N. Where the upper sides of the middle rail M, and lower rail L, in the sheer-plan, *fig. 1*, intersect the aft-side of the hair-bracket H, strike the horizontal lines 33 and 34, answerable to those in the half-breadth plan, *fig. 2*.

Where the lines 1, 2, 3, &c. which are square from the middle line in the half-breadth plan, *fig. 2*, intersect the lines O and N, let them be squared out from the lines O and N, in the same manner as was performed for P. Then take the distances from the lines 33 and 34, in the sheer-plan, *fig. 1*, (at the same perpendiculars as before,) to the upper side of the middle and lower rails, and set them off in the half-breadth plan, *fig. 2*, from their corresponding lines O and N, on the lines squared out. This gives the form of the upper sides of the middle and lower rails, which is sufficient to shew the method of laying off each rail, agreeable to their different cant or spread. The lower side of the rails is formed by a diminishing line to the moulding or depth of the rail at each end.

It is very seldom that the middle and lower rails are laid off on the floor only; the main or upper rail, when trimmed, is gotten up into its place, and moulds are there made to the head-timbers, and then the middle and lower rails are spread and equally divided thereon between the upper rail

rail and upper cheek, and the moulds made to them when their situation is determined on.

But in order to shew what may be performed on the floor, the timbers of the head may not only be laid off, but the bevellings taken, and the very scores for the rails be cut out thus :

Take the heights in the sheer-plan, *fig. 1*, at the aft-side of each head-timber, from the upper side of the upper cheek to the upper and lower sides of each rail, for the outside of the rail, and set them up from the base line of their corresponding timber, *fig. 3*, striking the horizontal lines as there ticked. Then take the distances from the middle line in the half-breadth plan, *fig. 2*, at the aft-side of each timber to the outside of each rail, and set them off on their corresponding ticked lines, *fig. 3*. Where the aft-sides of the timbers, in the half-breadth plan, *fig. 2*, intersect the inside of the middle and lower rails, let them be drawn square from the lines N and O, to intersect the lines of the rails laid off. Then take the distances from the lines N and O, on the lines squared out, to the lines of the rails laid off, and set them down from the lines 33 and 34, at the aft-sides of their respective timbers in the sheer-plan, *fig. 1*, making spots which form the upper side of the rails at the inside, the same as was performed for the upper rail. Take the distances from the upper side of the cheek in the sheer-plan, *fig. 1*, at the aft-side of the timbers, to the spots last mentioned, and likewise to the line for the upper side of the upper rail at the inside, and set them up from the base line of each respective timber in *fig. 3*, and strike a faint line. Then take the distances from the middle line in the half-breadth plan, *fig. 2*, at the aft-side of each timber, to the inside of the before-mentioned rails, and set them off from the middle line *u*, in the plan of the timbers, *fig. 3*, on their corresponding faint lines. This gives the upper part of the rails at the inside. The same operation may be performed to find the lower part of the rails at the inside ; or you may draw the inside of the rails perpendicular, and set down the depth of the rails agreeable to what they measure on the moulds, taken in the direction of the timber. This may determine the under side of the rails at the inside.

As the line of the chamfer of the upper rail N (being the fight-side of the rail when it is trimmed, and in its place) is before represented in the sheer-plan, *fig. 1*, take the height from the upper side of the cheek to the chamfer of the rail, at the aft-side of each timber, and set it up from the base line of each corresponding timber, *fig. 3*, striking faint lines parallel to the base line. Then take the half-breadths at the aft-side of each timber in the half-breadth plan, *fig. 2*, to the ticked line of the upper rail, (which is supposed to be where the rail is also to be chamfered,) and set them off from the middle line *u*, in *fig. 3*, on their corresponding lines last struck, and from thence draw the under side of the rail to the inside.

Having the upper side of all the rails, inside and outside, in the plan of the timbers, *fig. 3*, set off, draw the line for the upper side of the rails, which shews how much the inside of the rails is higher than the outside, if cut off in the direction of the aft-side of the timber. Then having the spots, as before mentioned, for the outside of the rails, (being on the ticked lines first drawn,) the under side of the rails may be drawn parallel to the upper, or to intersect the spot before-mentioned for the inside, which was set down agreeable to what it measures on the mould, taken in the direction of the rail, as it is marked on the mould.

Having the scores for the timbers, the half-thickness of the knee of the head at the aft-side of each timber, set it off from the middle line *u* on the base line of its corre-

sponding timber in *fig. 3*. Likewise take the height from the upper side of the upper cheek in the sheer-plan, *fig. 1*, to the ticked curve, representing the cutting-down or lacing of the knee, and set it up from the base line of each timber in *fig. 3*. This will give the score to be cut out, in order to let the timber meet its opposite at the middle line. Then set off the substance at the upper side of the upper cheek, and draw the inside and outside of the timber as represented in the plate. This will be the exact form of the timbers, or more particularly, of the scores of the middle rails ; and if laid off in the gross, might be performed to the greatest nicety.

To bevel the Timbers in the Head.—In the sheer-plan, *fig. 1*, set off the siding of the timbers, and strike in their fore-sides. Then square a line from the aft-side to the fore-side, from where the aft-side intersects the upper side of the cheek, as at 18, 19, 20, in the same manner as was done to find the bevellings of the cant-timbers.

Take the heights at the fore-side of each timber from its heel, as squared, to the upper and lower sides of the rails, in the same manner as directed for the aft-side, and set them up on the plan of each respective timber, *fig. 3* ; then set off the fore-side of each timber in the half-breadth plan, *fig. 2*, and take the distances from the middle line to the outside of each rail at the fore-side of each timber, and set them off on the plan of each respective timber, *fig. 3*, on their corresponding horizontal lines last mentioned. Where the fore-side of each timber in the half-breadth plan, *fig. 2*, intersects the inside of the middle and lower rails, let them be squared out from the lines N and O, to intersect the lines of their corresponding rails laid off. Then take the distances from the lines N and O, in the half-breadth plan, *fig. 2*, agreeable to the lines squared out, to the lines of the rails laid off, and set them down below their corresponding lines 33, 34, *fig. 1*, at the fore-side of each corresponding timber in the sheer-plan, *fig. 1*, making spots. Then take the heights from the square line at the heel up the fore-side of each timber in the sheer-plan, *fig. 1*, to the spots last mentioned, and set them up in the plan of their respective timbers, *fig. 3*, striking new horizontal lines. Then take the distances from the middle line in the half-breadth plan, *fig. 2*, at the fore-side of each timber to the inside of the rails, and set them off on their corresponding horizontal lines last struck, in the plan of each respective timber, *fig. 3*. This will give the direction of the upper side of the rails, and, if rightly performed, will be parallel to the upper side of the rails laid off for the aft-side.

In the same manner is every operation performed for the fore-side as was directed for the aft-side, the heights being taken from the heel as squared in the sheer-plan, *fig. 1*, instead of the upper side of the cheek, which shews how much the rails lift at the fore-side from a square ; and the half-breadths being taken at the fore-side of the timbers in the half-breadth plan, *fig. 2*, shew how much the scores at the fore-side of the timbers are under from a square with the aft-side, because the timbers in the half-breadth plan are square from the middle line.

Having the disposition of the rails for the fore-side of the timbers, set off the same distance from the rails as it is from the rails of the aft-side, both inside and outside, and mark the curves as ticked for the inside and outside of each timber, in the plan of the timbers, *fig. 3*. Then whatever distance the ticked lines of the fore-side are from the lines of the aft-side, so much is the outside of the timber under, and the inside standing from a square, agreeable to the siding of the timber. Or, having the aft-sides of the timbers laid off exactly, the fore and aft bevellings might be taken more cor-

rect from the half-breadth plan, *fig. 2*. The bevelling for the heel of the timbers may be taken agreeable to the flight of the upper cheek, because the cheek stands fore and aft; but it will not answer exactly to the other bevellings agreeable to the flight of the rails in the sheer-plan, *fig. 1*, unless they are taken to the lines of the rails when laid off in the sheer-plan; and then the bevellings must be applied close to the scores that are trimmed for the cant of the rails.

To Lay-off the Rails to the Cant in the Sheer-Plan.—The perpendicular lines must be drawn in the sheer-plan, *fig. 1*, the same as before, and likewise those in the half-breadth plan, *fig. 2*, answerable to them. Let fall a perpendicular from the intersection of the upper part of the upper rail N, with the aft-side of the hair-bracket H, in the sheer-plan, *fig. 1*, down to the upper rail P, as before canted in the half-breadth plan, *fig. 2*, to which point the rail must be supposed fixed. Then place a batten to the inside of the rail, as canted in the half-breadth plan, *fig. 2*, and mark on the batten the perpendiculars as at 12, and the intersection of the lines 1, 2, 3, &c.

Then in the sheer-plan, *fig. 1*, where the perpendiculars 1, 2, 3, &c. intersect the upper side of the upper rail, level aft-lines at pleasure, as you there see ticked; then place the batten to each level line, marking thereon its corresponding perpendiculars, observing always to keep the foremost perpendicular marked on the batten to the perpendicular Y. This gives the spots to which a batten pinned will form the upper side of the upper rail O, and is exactly answerable in form to the upper side of the rail N, in the half-breadth plan, *fig. 2*. While the batten is pinned to the form of the rail, mark thereon the stations 1, 2, 3, &c.; and when it is straight, place it to any perpendicular line, and mark the extremities of the rail, and the several stations, as at 26, *fig. 1*; then set off the moulded size at each end, and strike a straight line, which will give the tapering at every perpendicular, and a batten pinned thereto will form the under side of the rail.

In the same manner are the other rails to be performed in the sheer-plan. The aft-side of the after-timber being already laid off, and the cant of the middle and lower rails being determined on the half-breadth plan, *fig. 2*; let fall the perpendiculars 35, 36, where the lines 33, 34, intersect the aft-part of the hair-bracket H, in the sheer-plan, *fig. 1*, down to the half-breadth plan, *fig. 2*, and proceed as above.

It may be necessary to notice here, that when *Plate I.* was engraved, all vessels above a frigate in the royal navy had beak-heads, which mode has lately been discontinued: but such of our readers as may be desirous of knowing the best method of laying-off the beak-head timbers, are referred to the “*Elements and Practice of Naval Architecture*,” by Steel.

To Lay-off the several Parts of the Stern.

To Lay-off the Side Stern-Timber.—The side stern-timber must be laid off on the floor, and a mould made to it, so that when trimmed and put up in its place on the ship, that is, to the tumbling-home of the side, it should appear as its ticked line in the sheer-plan, *Plate I.* from whence it is transferred to the floor.

Strike the horizontal lines from the stern-timber in the sheer-plan, *Plate VII. fig. 11. Laying-off A*, to square-timber 36, at the wing-transom, at the side, at the knuckles of the upper and lower counters, at the top-breadth, and at the top-side. Likewise strike as many between the wing-transom and lower counter as may be thought necessary, that part being the most critical to obtain the exact form

of the timber. Then transfer these horizontal lines to the after-body plan, *fig. 5*, as you see ticked in the plate, and number them accordingly. Then take off the half-breadth of each horizontal line in the body-plan, *fig. 5*, at every square timber, as far forward as timber 28, and transfer them to their corresponding square timbers in the half-breadth plan, *fig. 6*. To these spots pin a batten, and mark the curves, or half-breadths, and continue them as far aft as the stern-timber in the sheer-plan, *fig. 11*, and number them in the half-breadth plan, *fig. 6*, as in the plate.

Where the horizontal lines in the sheer-plan, *fig. 11*, intersect the aft-part of the stern-timber, square them down, or let fall perpendiculars to their corresponding lines in the half-breadth plan, *fig. 6*, as shewn in the plate. This gives the ending of the after-part of the half-breadth lines. Then take off the half-breadths of the horizontal lines in the half-breadth plan, *fig. 6*, at their ending, as above-mentioned, and set them off on their corresponding horizontal lines in the body-plan, *fig. 5*. A batten pinned to those spots forms the aft-side of the stern-timber A, agreeable to the form in the sheer-plan. But if these half-breadths, when set off in the body-plan, should not make a fair line, then those in the half-breadth plan, *fig. 6*, which seem most to require it, must be altered at the after-end, till they all correspond to make a fair line in the body-plan.

Now set off the moulded size of the stern-timber upon each horizontal line, in *fig. 11*, to which pin a batten, and the fore-side of the timber will be represented, because the mould is to be made broad enough to be answerable to the fore-side of the timber.

Then, where the horizontal lines in the sheer-plan, *fig. 11*, intersect the fore-side of the timber, transfer them to their corresponding lines in the half-breadth plan, *fig. 6*, parallel to the other lines, which are ticked down from the aft-side, and on the half-breadth lines make the spots as you see in the plate. Then take the half-breadth of each horizontal line in the half-breadth plan, *fig. 6*, at the spots last-mentioned, and set them off on their corresponding horizontal lines in the body-plan, *fig. 5*. Pin a batten to these spots, and mark the line B, which is the fore-side of the timber, agreeable to the line for the fore-side in the sheer-plan.

Having in the body-plan, *fig. 11*, the form of the aft-side and fore-side of the stern-timber, as it appears upon an horizontal view when in its place, it follows next to point out a method to make a mould, in order to mould the timber, so that it shall have the same appearance when it is in its place upon a horizontal view, as it now shews in the sheer and body-plans. Unless there be a method which may be depended upon for the exact heights of the counters, it can be to no purpose to design a view of the stern, in order to dispose of the decks, the lights, and all other heights, in such a manner, that each part may bear a just proportion to the rest.

Strike the line C in the body-plan, *fig. 11*, the thickness of the mould from the side of the timber, to which place a batten, and keep one end well with the horizontal line at the end of the wing-transom, and mark on the batten all the horizontal lines in the body-plan. Then carry the batten to the sheer-plan, *fig. 11*, and keeping the end of the batten well with the horizontal line A of the wing-transom at the side, set up all the heights on the batten perpendicular, and strike them through the stern-timber parallel to the horizontal lines first struck, as you see in the plate. Where the ticked horizontal lines in the sheer-plan, *fig. 11*, first struck intersect the fore-side and aft-side of the stern-timber, square them up to the horizontal lines last struck. This will give the spots, to which a batten pinned will give the ticked

ticked lines I and H, to which the mould is to be made. The last heights which were set up are the proper heights of the knuckles and horizontal lines to be marked on the mould.

The ticked lines I, H, in the sheer-plan, *fig. 11*, to which the mould is to be made, are supposed to be the straight line C in the body-plan, *fig. 11*, standing fast at the wing-transom, and the head lifted up till it stands perpendicular; which, if lowered again to the direction of the straight line C, in the body-plan, *fig. 11*, will appear exactly the same as the stern-timber first laid off in the sheer-plan, *fig. 11*, which is the form of the timber required when trimmed and in its place.

In the next place, the mould should be so made, that the stern-timber shall be trimmed both ways by this one mould; that is, to the shape as it appears in the sheer-plan, *fig. 11*; and likewise to the fore-side and aft-side thwartship appearance in the body-plan, *fig. 11*.

Proceed to make the mould of dry seasoned inch-deal to the ticked lines I, H, *fig. 11*, in the sheer-plan, from the upper side of the wing-transom at the side to the head G; then, when the mould is in its place, mark on it the upper horizontal lines, in the same direction as they are laid off, distinguishing them by their proper names on the mould, as the lower counter at D, upper counter at E, heel at A, No. 1 at B, No. 2 at C, No. 5 at F, and head at G. Then take the distances from the straight line C, in the body-plan, *fig. 11*, to the fore-side of the stern-timber B, at every horizontal line, and in the direction of the horizontal lines, and set them down in figures at the fore-side of the mould on their corresponding horizontal lines; then proceed in the same manner, and set down the distances or spilings on the aft-side of the mould from the lines C and A. But to mould the timber from those spilings requires much trouble, and without great care taken, the stern-timber will not be exactly moulded.

Therefore, the most correct method of finishing the mould, and the easiest in application when moulding the piece, is, instead of having the spilings marked on the mould, to have brackets made of $\frac{3}{4}$ -inch deal, agreeable to the spilings (deducting the thickness of the mould) at each horizontal line, having their ends at the fore-side and aft-side cut exactly square from the mould, or their aft-sides may teach to the round-aft; then fasten those brackets to the under side of the mould, keeping the middle of their thickness exactly well with their respective horizontal lines, as they appear shaded in the sheer-plan, *fig. 11*, observing to keep the side of every bracket in the same direction from the mould as the bevel at F, *fig. 11*, in the body-plan, that is, to the inclination which the straight line C has from an horizontal plane in representing the tumbling-home of the stern-timber.

To be more exact, let the half-thickness of the brackets be gauged down to their ends, and the sides chamfered away thereto, which will direct upon the timber, when trimmed, the exact stations of the knuckles, and also of the horizontal lines.

The brackets may be so fixed on either side, as to mould the timber for both sides of the ship.

The mould, thus made, may be applied in any direction in moulding the timber, provided its upper side is kept straight, and out of winding. Then examine where the timber, in its rough state, deviates most from the under side of the brackets, and make that the general spiling to be applied from the under side of the brackets. Wherever this spiling must be applied beyond the brackets, owing to the inequalities of the piece, let a straight-edged batten, of suf-

ficient length, be kept well to the under side of the bracket; from which set down the spiling required, wherever it may touch the piece. Then by boring holes with a small gimblet, exactly in the direction of the gauge-line, at the ends of the brackets, and full as much below the brackets as the general spiling, you will preserve the exact moulding of the timber, after the rough wood is sawn off, agreeable to the mould.

To take the bevellings of the aft-side of the timber, the round-aft of the stern at the counters, and top-timber line, must be laid off thus in the half-breadth plan. Take the distance from the midship to the side stern-timber, on a square in the sheer-plan, *Plate I.*, and set it off upon the middle line, *Plate VII. fig. 6*, abait its corresponding perpendicular, as squared down from the counters, &c. at the side, sweeping curves to the laid round-aft on a square; then fix the tongue of a bevel to the different round-aft lines, and the stock parallel to the middle line will be the bevelling of the round-aft at each place, to be applied square from the mould.

Take the bevelling to cut off the heel from the body-plan, *Plate VII. fig. 11*, thus: fix the stock of a bevel to the line C, and the tongue to the round-up of the wing-transom, as at D; and apply it over the heel of the mould, when it lies in its proper place, to where the lower bracket strikes the timber.

Supposing the heel of the timber to be carefully trimmed, as above directed, a thin mould may be made to the section of the heel on the wing-transom, and the bevellings taken to lay it to the fashion-piece from the stern-frame, as that is generally in its place before the stern-timbers are trimmed.

The bevellings for the round-up of the knuckles of the lower and upper counters may be taken from the body-plan, *Plate VII. fig. 11*, by fixing the stock of a bevel to the aft-side of stern-timber A, and the tongue to the round-up, as at E, and so applied from the timber when it is trimmed.

To Lay-off the Stern and Quarter-Galleries, Plate X. Laying off D.

In *Plate VII. Laying-off A*, the laying-off of the side stern-timber to make the mould to, is represented in its proper situation, that the reader might have a clearer idea of the operation. But we are not to suppose that any mould-loft is broad enough to admit of the stern to be laid off in that manner; neither would it appear clear enough, if laid off in the body-plan.

Therefore, in some convenient part of the floor, lay off the horizontal (or level) view of the stern, as *Plate X. fig. 6*, from *Plate I.*; and likewise the quarter, as far forward as timber 32, as *fig. 4*.

Strike an horizontal line at the upper side of the wing-transom at the middle line, which will be a base line to the stern; likewise the lines 17 and 18 parallel to the base line, to intersect the knuckles of the lower and upper counters, at the side stern-timber 33, in *fig. 4*; continuing them through their respective timbers in *fig. 6*. Then take the heights from the base line, in *fig. 4*, to the knuckles of the lower and upper counters at the midship stern-timber 32, and set them up the middle line above the base line, in *fig. 6*. Then spring the arc of a circle through those heights in *fig. 6*, and as far as the quarters project, as B, B, which will be the knuckles of the timbers. Design the lower and upper counter-rails in *fig. 4*, and set off the projection of the plank of each counter, thus: square out a line from the knuckle of each counter of the midship-timber 32, as *a* and *b*, and draw the thickness of the plank of each counter

SHIP-BUILDING.

parallel to the timber, which gives the under side of the rails; then transfer the upper and under sides of those rails from *fig. 4*, to the middle line, *fig. 6*, and describe parallel curves to the knuckles 42 and 43; and the upper counter-rail B, and lower counter-rail A, will be also represented in the plan of the stern, *fig. 6*, and that will shew how much the fight-part of the rails will be on a level view below the knuckles of the timbers.

But the round-up and round-aft of the counter-rails, to make the moulds to for trimming the rails, must be laid off on a square, thus: from the fore-side of the rails at the midship-timber 34, in *fig. 4*, square in a line from the knuckle to touch the side-timber 33; then take the distance from the knuckle of the upper counter from the midship-timber 32, to the side-timber 33, in the direction of the above square line, and set it off from any straight line, as A A, at C C, *fig. 9*, which is the knuckle or breadth of the upper counter, squared down from *fig. 6*. Then spring the arc B B, which is the round-aft of the upper counter, on a square.

Next take the distance from the knuckle of the upper counter, at the side-timber 33, to the line squared in from the knuckle of the midship-timber, and set it off as before at C C, above the line A A, *fig. 9*, and spring another arc, which will be the round-up of the upper counter, on a square. Proceed in the same manner with the lower counter, and we shall have both rails laid off to the round-up and round-aft on a square.

This is the best way to make the moulds for the round of the rails; because if the rails were cut out of a fying plank, or piece of thick-stuff, the round-up would be the same; that when put in the boiler, and set to the round-aft, they would then have their proper round-up on a level view; or, were they cut out of a small piece of timber, it would answer the same purpose, and be most expeditious and exact.

The counter-rails may be cut out of a straight piece of timber, without kilning them, as they are apt to fly after that process, thus: take the round-up and round-aft together, that is, from the knuckle of the side-timber to the knuckle of the midship-timber, and spring an arc thereto, as before; then when the rails are trimmed to the sheer, and the fore-side canted to the timber, they will exactly conform to the round-up and round-aft, when put in their places.

Having the round-up of the lower and upper counter-rails in *fig. 6*, and continued them far enough out for the projection of the quarter-galleries, round up the quarter-deck in the stern, agreeable to the upper counter-rail, in the following manner: take the height from the upper counter-rail, in *fig. 6*, to the quarter-deck, in the direction of the side-timber at the inside; and set it up the middle line of the stern. This makes the quarter-deck round more than the upper counter-rail, and adds life to the stern; for the upper part of the lights in the stern should be parallel to the transom. And if they were to round by the same mould as the upper counter-rail, the bars in the sashes next the side would be longer than those in the middle line, and would appear as if the top of the lights rounded less than the upper counter-rail. In the same manner dispose of the round of the poop, or round-house.

This should determine the round of the decks abaft; and the beams of those decks, as they approach aft in *fig. 4*, must be gradually increased in their round-up, to correspond with the transom.

Observe that the above lines, in *fig. 6*, for the quarter-deck, shew the round of the deck at the stern-timbers,

without considering at present the projection of the balcony.

Set off within side of the stern-timber, in *fig. 6*, the thickness of the clamp, and the projection of the cornice in the cabin, and let that be the side of the light. Then determine on the breadth of the munions, allowing sufficient for the weights and pulley-pieces, and divide the other lights equally. Set off likewise the mock-light in the aft-part of the quarter-gallery, the same size as the rest. About half the breadth of the munions from the mock-light, place the inside of the quarter-piece; then determine on the breadth of the quarter-piece at the heel. About the middle of the quarter-piece place the outside of the gallery, which determines the outside of the gallery on the quarters, *fig. 4*. Having the breadth of the lower part of the lights in the clear, let the depth be one-third more than the breadth at the lower part; set off upon the rake of the stern-timbers, in *fig. 4*, and transfer that to *fig. 6*, which makes a good proportional light. But observe, between the upper counter-rail and the lights must be room allowed for the sash-fills, and about one inch and a half between their heads and the transom above. Then determine on the out-bounds of the taffrail and quarter-pieces, and lower finishing.

Next dispose of the quarter-gallery in *fig. 4*, shewing the out-lines of the quarter-piece and taffrail, thus: let fall a perpendicular from the knuckles of the lower and upper counters of the midship-timbers, in *fig. 4*, as you see ticked and numbered 14 and 15; then where the horizontal lines 17 and 18, from the knuckles of the side-timber, intersect the perpendiculars 14 and 15, take those distances, and set them off from the knuckles of the side-timber, in *fig. 6*, down the perpendiculars, *c, c, f, f*; from thence spring the arcs 24, 24, and 26, 26, to touch the horizontal lines 17 and 18, at the middle line, which are called *round forward on a level*. Then will the ticked curves 24, 24, and 26, 26, be answerable to the ticked perpendiculars 14, 15, which fall from the knuckles of the midship-timber in *fig. 4*.

Take the heights from the base-line, in *fig. 6*, to the knuckles of each counter, at the outside of the gallery, at the ticked perpendiculars *d* and *e*, and set them up from the base line in *fig. 4*, striking the ticked horizontal lines *c* and *d*. Then from the horizontal ticked lines 17 and 18, in *fig. 6*, take the length of the perpendiculars *d* and *e*, to where they intersect the ticked curves 24 and 26, or round forward on a level, and set them off forward from the perpendiculars 14 and 15, in *fig. 4*, on the horizontal lines *c* and *d* respectively, which will give the exact knuckles at the timbers, in *fig. 4*, at the outside of the gallery. Then take the heights of the ends of the rails from the base line at A and B, *fig. 6*, and set them off from the base line in *fig. 4*, at the knuckles of the timbers last mentioned, and continue them forward, agreeable to the sheer of the ship. This will give the exact heights of the lower and second counter-rails, as they will appear on the ship, if the work be conformable to the floor.

To Lay-off the Foot-Rail of the Balcony.

Here we may again repeat the observation, which was made about laying-off the beak-head timber, that since *Plate I.* was engraved, the sterns of all ships of the line are now continued upwards to the round-aft of the second counter-rail, without any balcony, as they are much stronger so, and more useful, if guns are wanted to be used right-aft occasionally. Nevertheless, ships of 50 guns have at present a balcony or walk in the stern.

To understand the exact form of the balcony-rails, as they appear in the sheer-plan, and likewise in the plan of the stern,

SHIP-BUILDING.

stern, will require much attention, and some pains taken to be made correct.

Where the quarter-deck line at the side intersects the side-stern timber 33, in *fig. 4*, let fall the ticked perpendicular 13 to the half-breadth plan, *fig. 5*; and on that perpendicular set off the half-breadth of the quarter-deck at the stern-timber, from the middle line in *fig. 5*, as taken from *fig. 6*. Then square down from the last perpendicular, where the under side of the deck at the middle line intersects the midship-stern timber, in *fig. 4*, to the middle line in *fig. 5*; and spring an arc, as the ticked curve I, shewing the round-aft of the stern, at the under side of the quarter-deck, and also at the aft-part of the timbers, the heads of which run up to the under side of the quarter-deck. But sterns having no balcony, the timbers are continued upwards as much above the taffrail as they may be wanted, which certainly must add strength to the stern.

In *fig. 5*, draw the side stern-timber, which requires to project aft, about ten inches farther than the midship-timbers, as at 24, for the convenience of the necessities in the quarter-gallery, and abaft that allow three or four inches for the ballusters in the aft part of the quarter-gallery, and let that be the aft part of the quarter-deck at the side. Then design, in *fig. 5*, the midship part of the ends of the deck. That part, from the side-timber to the outside of the gallery, (being the aft part of the stool,) must be parallel to the ticked line I.

Strike the perpendicular line 43 abaft *figs. 4* and *5*, and where the ticked line I, which is the round-aft at the heads of the timbers in *fig. 5*, intersects the outside of the timber, take that half-breadth, and set it off on the perpendicular 43 from the middle line. Then take the round-up of the quarter-deck on a perpendicular, in *fig. 4*, at the side-timber, and set it off on the half-breadth last taken from the perpendicular 43, and spring the arc H, which is the round-up of the quarter-deck, on a perpendicular.

Let the quarter-deck, at the middle line in *fig. 4*, be continued as far aft as the ends of the deck *c*, in *fig. 5*; then from the line for the under side of the deck, drop as many perpendiculars as may be thought sufficient to find the true form of the under side of the deck, from the side to the midships, as may be seen numbered 23, &c. in *fig. 4*. Carry down those perpendiculars parallel to the line 43, to intersect the ends of the deck *c*, in *fig. 5*, and from thence carry them aft parallel to the middle line, to intersect the round-up of the deck H. Then take the distance from the line 43, to the curve H, for the round of the deck at 14, *fig. 5*, and set it down the perpendicular 3, from the under side of the deck, *fig. 4*. (for *per. 2* was too small a round to be perceived in the plate); continue the same regular to 20, *fig. 5*, which answers to *per. 9*, in *fig. 4*. Take the half-breadth in *fig. 6*, to the outside of the quarter-deck stool, and set it off square from the middle line to intersect the ends of the deck *c*, in *fig. 5*. Then carry aft, as before, to the curve H, the intermediate lines 21, 22, with 23, at the outside of the stool, and also carry them up to the under side of the deck in *fig. 4*, as 10, 11, 12. Then take the distances from the line 43 to the round of the deck H, in *fig. 5*, at 21, 22, 23, and set them off below the under side of the deck, on the perpendiculars 10, 11, 12. Then through these spots, and those before set off, draw the ticked curve to the aft part of the quarter-deck at the middle line. This will be the exact form of the under side of the quarter-deck, if cut off agreeable to the plan, *fig. 5*, from the outside of the stool in *fig. 4*. Draw the ticked line 40, in *fig. 4*, agreeable to the sheer of the ship, and set off below the line 40 about one inch and a half, or as

much as the joiners require for the panning which is at the under side of the balcony, and from that set up the depth of the rail. This will give the exact height of the foot-rail in the sheer, *fig. 4*.

To find the proper height of the aft part of the quarter-deck at the under side, answerable to that in the sheer, *fig. 4*, take the half-breadths at the ticked lines 14 to 23, on the line 43, in *fig. 5*, and set them off from the middle line on the base line, as on the left-hand, in *fig. 6*, and erect perpendiculars as high as the under side of the deck. Then take the heights from the base line, in *fig. 4*, to the under side of the deck, at Nos. 2, 3, &c. and set them up on their corresponding perpendiculars in *fig. 6*. Through these spots get in a ticked line, which will give the under side of the deck in *fig. 6*; then set off the thickness of the deck, and get in the parallel line above it. Likewise set off the foot-rail, as before directed, in *fig. 4*. This will give the exact form of the foot-rail, in *fig. 6*, agreeable to the round-aft in the plan of the quarter-deck, *fig. 5*.

To Lay-off the Breast-Rail of the Balcony.

It has been customary to mould the breast-rail of the balcony with the same mould as the foot-space-rail is done with. But to complete the range of ballusters in the balcony, so as to make them have an agreeable rake in the sheer, *fig. 4*, and likewise a proper diminish of tumbling-home in the plan of the stern, *fig. 6*, the following method only can be relied on.

In the plan of the stern, *fig. 6*, let the side-timber be produced upwards till it intersects the middle line; and from that point to the above-mentioned stations at the under side of the quarter-deck, in *fig. 6*, make ticked lines as high as the breast-rail. Whatever height the upper side of the breast-rail is intended to be at the middle line, in *fig. 6*, take that height from the deck at the middle line, and set it up from the deck at the several ticked lines in the direction of the said lines, as well as at the side-timber. Through these spots get in the upper side of the breast-rail D, in *fig. 6*. Supposing those ticked lines to be ballusters, they should all be of an equal length. Where the perpendicular ticked lines 2, 3, &c. in *fig. 4*, intersect the ticked line for the deck at the side, draw them upwards parallel to the side stern-timber; then take perpendicularly the heights of each of the ticked lines at the upper side of the breast-rail from the base line in *fig. 6*, and set them, as taken from the base line, *fig. 4*, to intersect their corresponding lines last-mentioned. Through these spots draw the curve K, which is the upper side of the breast-rail, as it will appear in the sheer, *fig. 4*.

Drop the ticked perpendicular 1, from the aft-side of the breast-rail, *fig. 4*, to the middle line, *fig. 5*, and parallel to that the ticked perpendiculars 2 to 11, which will be found to intersect the ticked lines at the upper side of the breast-rail in *fig. 4*. Then take the distances (or half-breadths) from the ticked lines afore-mentioned at the upper side of the breast-rail in *fig. 6*, to the middle line; and set them off on their corresponding perpendiculars 2, 3, &c. from the middle line in *fig. 5*; a batten pinned through these half-breadths forms the line G, or upper side of the breast-rail. But observe, it only gives the form of the breast-rail corresponding with the aft part of the deck *c*; therefore, if the ballusters are laid off in this manner, the fore-side of the mould is the readier to apply on the deck, in order to cut off the deals, and what the rail is intended to rebate on the ends of the deals must be added thereto, and as much wood as is necessary to raise the members of the rail must be left on the mould abaft the line *c*.

SHIP-BUILDING.

line *c*. Whatever is left abaft the foot-rail mould must be also left abaft the line *G* for the mould of the breast-rail, upon a supposition that both moulds are made to suit the aft part of the ballusters. The half-breadth of the rails only being laid off is the most correct, for then the moulds will be made in two halves exactly alike, and may be scarfed and nailed together in the middle from any straight line. The middle line and outside of the timber should be marked on each mould.

To Lay-off the Taffrail and Quarter-Piece.

The form of the taffrail and quarter-piece, in *fig. 6*, being laid off from the plan of the stern, *Plate I.*, square up from *fig. 5*. what the stern projects at 24, to the quarter-deck in *fig. 4*, and continue it upwards parallel to the side stern-timber to the top of the side, as you see ticked; then set off the half-breadth of the stern at the quarter-deck, and likewise at the top of the side on the ticked line 25, *fig. 6*, taking the round-aft at each place, and set it aft at the corresponding heights from the above ticked line in *fig. 4*. This will give the ticked line *T*, being the midship-timber at the upper part of the stern, or the fore-side of the taffrail at the middle line. Let this ticked line *T* be answerable to the line *A A*, *fig. 9*.

Drop as many perpendiculars from the top of the taffrail and outside of the quarter-piece, as in the left-hand of *fig. 6*, as may be thought necessary. Take the perpendicular heights from the base line in *fig. 6*, to the several perpendiculars last mentioned on the taffrail and quarter-piece, and set them up from the base line in *fig. 4*, and strike in the horizontal lines 22 to 31, the last being the height of the taffrail at the middle line. Take square from the middle line in *fig. 6*, where each perpendicular intersects the upper part of the taffrail and outside of the quarter-piece, and set them off from the middle line on the ticked line 25, *fig. 6*; then take the distances from the ticked line 25, to the round of the stern on a level 26, 26, at each line squared down, and set them off on their corresponding lines last struck in *fig. 4*, from the ticked line *T*, forward in the direction of the ticked lines. A batten pinned to those spots will give the ticked curve *Q* in the middle of the quarter-piece (which, in a thwartship view, is the aft-part of the timbers, supposed to be continued to the heel of the quarter-piece); then abaft this ticked line set off the aft-side of the taffrail, and continue it to the heel of the quarter-piece; that will determine the aft-side of the quarter-piece, from which set forward the siding of the quarter-piece, and that gives its fore-side, as it will appear when in its place.

The rims and stools might be all laid off on the floor; but it would appear confused on the plate, and perplex the reader. And, indeed, the making of a handsome quarter-gallery depends chiefly on the performance on the ship; therefore an explanation may give more useful information than a drawing.

The length of the rims and stools being determined in *fig. 4*, the breadth abaft need only be taken from *fig. 6*, and let the stool at the quarter-deck serve for all the rims and stools in the quarter-gallery, keeping the foremost end well. At least, the same mould that moulds the stool at the upper parts of the lights, may mould the rim at the lower part of the same lights, because the munions in the quarter-gallery should be all out of winding; and in order to make them so, the stool at the quarter-deck will require to be longer than the rim at the lower part of the lights, more or less, according to the winding of the top-side. This might be allowed for exactly in laying-off the stools;

but it is better to leave the stool at the quarter-deck long enough, and proceed in the following manner.

Suppose the rim at the second counter-rail to be trimmed agreeable to the form of the stool at the quarter-deck, and to be in its place on the ship; and suppose the stool at the quarter-deck to be fayed to the side: then set off the breadth of the stool at the aft part, and nail a batten from thence to the rim. Then set off the munions on the rim, and at every munion on the rim hold a straight batten from thence to the under side of the stool, and look them out of winding with the batten at the aft part, or with each other, observing to set off the same distances at the under side of the stool from the aft part as they are on the rim. Then the wood may be dubbed away, or the stool taken down, and mould the under side (which will nearly agree) to every spot, with the same mould as the rim was moulded with. Then you may be certain the fashes will be out of winding, and, if required, would slide from one end of the gallery to the other. Then, when the munions are set off, you may find a greater distance from the foremost munion to the side on the stool, than there will be on the rim; but this cannot be avoided, and is of but little consequence; because the canting-livre, or console-bracket, is introduced on purpose to intercept the finishing of the gallery with the ship-side: for if the stool at the quarter-deck was to be no longer than the rim at the second counter, it would fall into the hollow of the top-side at the foremost end, and the foremost munions in the view of the sheer, *fig. 4*, would appear to rake more than the after ones; and when looking from before the gallery, the munions in the lower and upper gallery would not appear out of winding, but the whole gallery would seem in confusion; therefore the upper gallery must undergo the same operation, and then it will bear to be viewed in any direction.

It is requisite, at least, to lay off the stool and rim of the lower gallery, and allow for the winding of the top-side, in order to mould them nearly; but by following the above method in the performance of the work, any little error that may happen will be corrected.

To lay off the lower rim *B*, and middle stool *c*, *fig. 4*, to make the moulds to, transfer the height of the upper side of the lower rim *B*, and upper stool *c*, in *fig. 4*, continued forward to square timber 32, to the body-plan, *Plate VII. fig. 5*, upon its corresponding square timbers. Then take the half-breadths as far forward as square timber 32, and set them off from the middle line on their corresponding timbers in *Plate X. fig. 5*, and produce the half-breadth lines, and thickness of the planks *A* and *B* without it, as far aft as in the plan, *fig. 5*.

Then square down the knuckles of the upper counter from *fig. 4* to *fig. 5*, and spring an arc to the round-aft, which will be the fore-side of the upper counter-rail. Next sweep another arc to the thickness of the upper counter-rail, parallel to and abaft the ticked curve, and the upper counter-rail will be shewn in the plan, *fig. 5*. Then take the half-breadth of the upper side of the upper counter-rail to the outside, *B*, in *fig. 6*, and set it off from the middle line in *fig. 5*, on the ticked perpendicular 13, as squared down from the outside knuckle. Thence form the curve *F*, or outside of the lower rim. The ticked parallel line within is the outside of the munions, upon which set off the stations of the lights, making them all alike, and the munions 44, 45, 46, 47, between. Square up the munions to the upper side of the lower rim in *fig. 4*; and from the spots squared up strike lines parallel to the side stern-timber, to the under side of the middle stool. The aft part of the middle stool is already laid off in *fig. 5*, and the form of the outside may be

SHIP-BUILDING.

be determined by the inside of the mould of the lower rim keeping the fore end well, and allowing the additional length required by the winding of the top-side, &c. Then to prove that the outer edge of the rim and stool are out of winding, square down the sides of the munions from the under side of the middle stool in *fig. 4*, to the outside of the middle stool in *fig. 5*; and at the aft-sides of the munions, take their half-breadths from the middle line, and set them off square from the middle line in *fig. 6*, upon the under side of the middle stool. In the same manner take off the half-breadths of the munions on the rim, and set them off on the upper side of the upper counter-rail. Then strike lines to those spots in *fig. 6*, and they will be parallel to the side stern-timber and each other, consequently out of winding. The upper gallery rim and stools may be laid off in the same manner, and the moulds also made; observing to rake the munions of the upper lights agreeably to those below, which may be set off as follows. Determine on the fore-part of the upper gallery, and continue it upwards as the ticked line H, in *fig. 4*; then with a batten, fitted as square as possible from the fore-side of the foremost munion, mark on it the sides of all the munions. Then fit the same end of the batten to the ticked line H, and move it diagonally, till the aft-side of the after-munion touches the fore-side of the quarter-piece, and mark all the sides of the munion as on the ticked line H; then striking lines through those spots parallel to the rake of the lower munions, the lights and munions will be represented in the upper gallery.

The upper and lower finishings may be formed at pleasure, making them as light as possible, to please the eye, and containing sufficient room in the upper finishing to hold a cistern.

To Lay-off the Stern upon the Rake.

The horizontal plan of the stern being laid off, proceed to lay off the stern upon the rake; or, at least, the taffrail and quarter-pieces. For, were moulds made to them as already laid off, it is easy to conceive that they would be too low and too narrow, when fixed upon the stern, to its round-aft and rake; which must be the case upon the ship. In the plan of the stern, *fig. 6*, strike up lines in the middle of each munion, one in the middle of the side stern-timber, one up the inside of the quarter-piece, and one between, to rake upwards to the centre of the stern, at the middle line, as marked 35, 36, 37, and 38, as on the right hand.

Draw the horizontal line B B through *figs. 7* and *8*, which will correspond with the ticked lines 25, 25, at the upper counter in *fig. 6*. Take the perpendicular heights of all the timbers, from 35 to 38, and at the inside of the quarter-piece in *fig. 6*, from the lines 25, 25, to the ticked curve for the knuckles of the upper counter, and set them up from the line B B in *fig. 8*, and draw parallel lines thereto, as you see ticked, and numbered 9, 10, &c. Take likewise the perpendicular heights from the lines 25, 25, *fig. 6*, to the intersections of all the timbers, with the under and upper sides of the taffrail and quarter-piece; and set them up from the line B B, in *fig. 8*, where they are ticked and numbered as before.

Strike lines to the rake of the midship and side counter-timbers above the upper counter-rail, taken from *fig. 4*, and transferred to *fig. 8*, as the ticked lines 32 and 33. Draw a line square from the midship stern-timber 33, in *fig. 8*, to intersect the knuckle at the upper counter at the side-timber, as the ticked line 30; then continue the midship-timber 32 down to the line 30; then take the distance from the midship to the side-timber in the direction of the ticked line 30, and set it off from the line A A, in *fig. 9*, on the ticked

lines C, C, and raise the arc B B, which shews how much the stern rounds aft on a square, agreeable to the breadth of the upper counter, which round-aft governs all the stern above, as before observed.

Where the timbers 35, 36, 37, 38, and inside of the quarter-piece, *fig. 6*, step on the ticked line 42, or knuckles of the upper counter, square them down to *fig. 9*; then take the round-aft of each timber from the line A A, *fig. 9*, and set them off square from the midship-timber 32, so as to intersect their corresponding level lines in *fig. 8*. Then where the above timbers in *fig. 6*, intersect the upper part of the taffrail and quarter-piece, let them be squared down as before; and transfer the round-afts to their corresponding level lines in *fig. 8*, setting them off square from the midship-timber, as before. Then from these spots, down to the spots on the level lines of the knuckle of the upper counter, strike the lines of the intermediate timbers, and mark them 1, 2, 3, &c. which shews the thwartship view of the timbers, as stationed in *fig. 6*.

If the side-timber 33, and midship-timber 32, were prolonged in *fig. 8*, till they intersect each other, that would be the centre for the intermediate timbers, as disposed in *fig. 6*, and prove the work.

It will be necessary to have one spot at the outside of the quarter-piece, as 39, *fig. 6*, and squared down, as before, to the round-aft, *fig. 9*; then take its round-aft at 11, *fig. 9*, from the line A A, and set it off square from the midship-timber 32, in *fig. 8*, on its corresponding level line 16, as transferred from *fig. 6*.

Square down the heel of the quarter-piece where it intersects the knuckle-line, 42, *fig. 6*, to *fig. 9*, to the round-aft B B. Then pin a batten to the round-aft on a square B B, *fig. 9*, and keeping it fast at the middle line, mark spots on the batten, where the ticked lines 2, 4, 7, 10, 12, and outside of quarter-piece, are squared down from the knuckle-line 42, *fig. 6*. Then fit the same end of the batten well to the middle line, *fig. 7*, keeping it straight along the line B, and thereon mark the several spots on the right hand, and likewise on the left. Then, if the floor will admit of it, continue upwards the spots in the middle of the side counter-timber, as at 13, 13, *fig. 7*, till they intersect the middle line, and from thence, as a centre, may all the other spots be continued upwards, as in the plate. But if this cannot be performed, the heights of the timbers 35, 36, &c. must be taken up their perpendicular lines, from the line 25, 25, *fig. 6*, to where they intersect the upper side of the taffrail and quarter-pieces, and set up from its corresponding line 25 the middle line in *fig. 7*, striking horizontal lines; then pin a batten, as above, to the round-aft B B, *fig. 9*, and mark spots thereon at the middle line, and perpendicular lines 1, 2, 3, 5, &c. squared down from their heads; and set them off upon their corresponding heights last set off in *fig. 7*; then lines struck through those spots to the spots before set off on the line 25, or B B, the timbers will have their regular tumble-home, as from the centre in the plate. Then take the distance square from the line 30 in *fig. 8*, up each separate timber, to the spots on the level lines for the upper part of the taffrail and quarter-pieces; and set them up square from the line B B, *fig. 7*, to intersect their respective timbers, and in like manner the spot at the outside of the quarter-piece; then a batten pinned to those spots will represent the boundary of the stern or taffrail T, and quarter-pieces Q, Q, on the rake, *fig. 7*. Then take the heights square from the line 30, *fig. 8*, up the separate timbers, to the heights for the lower part of the taffrail and inside of the quarter-pieces, and set them up, as before, on their corresponding timbers in *fig. 7*; then by pinning a batten

SHIP-BUILDING.

batten to those spots, the under side of the taffrail I, and inside of the quarter-pieces, will be completed to make the moulds to. The cove-rail D may be also marked on the taffrail mould, and likewise upon the quarter-piece mould.

Practical Directions for the actual Building.

Having now explained the usual methods of forming the draughts, and laying off the several parts of the ship, it remains only to describe the progressive manner of its actual building, or putting together the several parts.

A slip being provided, the blocks on which the keel is laid are usually about five feet asunder. Each block is laid upon a ground-way in the middle of the slip, unless a smaller vessel is intended to be built where the launch has been laid for a large ship. In this case, by keeping the blocks towards one side, the sliding-planks may be preserved for that side.

The blocks, being the foundation of the whole, must be very carefully fixed, and their upper surface to a declivity of five-eighths of an inch to every foot in the length, observing that there may be water enough to launch the ship into, and keeping them high enough at the fore-part to clear the fore-foot of the ground-ways in launching, and to admit of the sliding-planks to be laid with a declivity of about seven-eighths of an inch to a foot.

The caps or upper blocks should be more in depth than the false keel; and they should be clear-grained oak, that they may split out the easier when the false keel is put under.

The upper sides of the blocks are made straight fore and aft, and level athwartships; sometimes the after-blocks are raised above a straight line, as the great weight of the stern and overhanging generally settle in building.

Keel is generally elm, sawn straight and square, and is scarfed together with coaks, with tarred flannel between each scarf, which are firmly bolted together and caulked.

The rabbet for receiving the plank of the bottom may be trimmed out, leaving about a foot at each end of the scarfs, for the better caulking the butts. In the navy, the rabbet is lined parallel to the upper side of the keel to the thickness of the bottom plank; but, in most merchant-ships, the rabbet is taken out of the middle of the keel, to prevent its canting, should the ship take the ground. The keel is set fair and straight along the middle of the blocks; and, to keep it in that position, tree-nails are driven along its sides into the blocks.

Dead or rising-wood is of oak timber, and fayed upon the upper side of the keel. The pieces along the midships are of a parallel thickness, and in breadth to overhang the keel about two inches on each side. The dead-wood afore and abaft, for the security of the half-timbers, is as high as the cutting-down. This part of the dead-wood below the stepping-line is trimmed to the shape of the body, and above the stepping, perpendicular to the size of the keelson. The scarfs or butts of the dead-wood should give scarf to the butts of the keel, and to each other.

Stem is composed of two or more pieces of oak timber, of the best quality, as shifting it is very expensive. It is sawn to its siding and moulding, then trimmed and scarfed together as the keel, and the rabbet taken out likewise.

On the stem should be marked, from the mould, the heights of the harpins, decks, cheeks, &c. and a line square from the keel, and a middle line as a guide to set it by.

Apron is also oak sawn to its siding and moulding, and fayed to the aft-side of the stem, to succour it at the scarfs, which are bolted through the apron, observing to place the bolts within the rabbets.

Bollard-timbers are oak sawn to their siding and moulding,

their heads in wake of the bowsprit to be left the thickness of the plank inside and out; they are fayed and coaked to the sides of the stem and apron, and bolted through, where practicable, observing to place the bolts clear of the deck-hooks. Sometimes oak fillings are fayed between the stem and bollard-timbers, to keep them more open in wake of the bowsprit.

Hawse-pieces are oak sawn to their siding and moulding, and are fayed to the bollard-timbers, and to each other, in wake of the hawse-holes; and are opened above and below the hawse-holes, for the admission of air, to about one inch and a half. When in their places, they are to be bolted to the bollard-timbers and each other, clear of the hawse-holes and breast-hooks. Let it be observed, that the hawse-pieces should be so disposed as to be equally cut by the hawse-holes.

Stern-post is oak sawn to the siding and moulding, and should be provided for the top, and to work upwards, if to be got. The rabbet is trimmed out on each side, to receive the plank of the bottom, to the shape of the body; and a tenon left on the heel, one-third the depth of the keel.

Inner-post is oak sawn to a parallel breadth, and sided, as the shape of the body may require, below the head: it is fayed to the fore-side of the stern-post, and a tenon is made on the heel as on the main-post, and the head left long enough to tenon an inch into the transom next above it.

Transoms are oak sawn to their siding, whether rounding upwards or straight; and to the moulding by their respective moulds. The wing-transom, if sawed only to the margin bevelling, may be brought in for other uses, if found defective; for transoms require much trouble and expence to shift them; the quality of the timber ought, therefore, to be of the best, and quite free from any defect whatever. In converting the transoms, let care be taken to work them top and butt alternately.

The transoms are to be trimmed with the greatest nicety, and then let on the post, with scores on each side of about an inch; observing the greatest exactness in letting them down, and that they stand at right angles with the middle line on the post. The ends, when cut off to the mould, are left one inch and a half longer, to tenon and face on to the aft-sides of the fashion-piece. The ends may be opened or mouthed, to admit the air.

Fashion-pieces are oak sawn to their siding, then to the mouldings and bevellings; and, when trimmed, let on to the ends of the transoms, in the manner already described.

Frame-timbers are oak sawn to their siding, straight, and out of winding, then moulded and sawn to their respective bevellings, except the cant-floors, which are sided to their proper cant.

The frame-timbers should be converted of sound well-grown timber, without sap or vein appearing in wake of the ports, and sawn full to their sidings, so that their scantling may remain after the ports are trimmed out. Every timber should also be provided to its length, consequently each should stand upon its proper head; or if one timber happens to be short, provide the next long enough to make good the deficient length, as *through-chocks* should always be rejected, or only admitted on extraordinary occasions. The heads and heels of all the timbers to have one-third of the substance left the moulding way, when trimmed; and the seats of the chocks should not exceed once and a half the siding of the timber.

In providing the floors, care should be taken to reverse the butt end of each succeeding floor, because the tops may

sometimes be scanty; and, when short of the floor-head, may be admitted, if the second futtock runs down and meets upon its respective floor.

All floors are required to have sufficient wood to seat themselves on the dead-wood, and the throats to run up to the cutting-down or under side of the keelson; then any wood wanting below the seating may be made good by a chock.

The floors, when correctly trimmed, are let down into scores cut in the dead-wood, to the exact height of the cutting-down from the upper edge of the rabbet of the keel, in their respective situations; set precisely level, and at right angles with the middle line of the keel. The floors are then ribbanded and shored, securing the shores at the head and heel to prevent any alteration; for the truth and precision of the whole fabric may be said to depend upon the accuracy of the floors, when got into the ribband.

Futtocks.—The several futtocks are trimmed straight, and out of winding on the joint side; and the lower futtocks in the navy run down to the side of the dead-wood, but in merchant-ships they are from nine to twelve inches short of the keel, that water may not lie above the ceiling. The wood wanting on the inside of the lower futtocks, in the navy, is made good by cross-chocks up to the cutting-down.

The timbers that compose a frame, or bend, are bolted together, either close or opened, as required; the joint-side of the second futtock to the joint-side of the lower futtock, to the middle of its length or scarfing, and bolts thereto with three bolts of square iron. The heel of the third futtock joins the head of the lower futtock, and bolts, as the former, to the second futtock; the heel of the fourth futtock joins to the head of the second futtock, and bolts to the third; and the heel of the top-timber scarfs on the head of the third futtock, and is bolted or fastened with tree-nails to the fourth futtock, taking care that no bolts are driven in wake of the ports or port-fills.

They are raised into their places by sheers and tackles, and great care should be taken that the frame be not strained in hoisting, as its form would be altered, and of consequence the true shape of the body lost; to prevent which, the joints of the chocks and heads are secured by nailing quarter over them, and a shore fitted on the inside or bag of the frame.

The frames, as hoisted, are kept to their true breadth, and equally distant from the middle line, by the cross pales, which are nailed at the main height of breadth, or in the ports: the latter is preferable, if not thought too high, because the ends need not be cut, and they may remain till the ship is planked, and the beams in and kneed.

The frames are next ribbanded thus: the cant-frames may be gotten near to their stations by the harpin-moulds, then the harpins gotten up; and, if the frames come fair, may be nailed and shored to their firmarks.

The square frames, corresponding at the floor-firmark or guide, must be levelled, and the joints set at right angles with the middle line, observing that the spacing of the ports agrees. The ribbands may then be nailed and shored, and the lower futtocks bolted to the floors.

Filling-timbers, or the timbers between the frames, are trimmed and hoisted into their places separately; then equally spaced afunder, and nailed to the ribbands; then chocked at their heads and heels, and the whole frame dubbed fair inside and out to its scantling for planking.

Keelson is oak sawn to its siding and depth, or moulding, then fayed along the middle of the floors, and bolted through every floor and the keel, with three or more douls

on each scarf, which should give as much shift as possible to the scarfs of the keel. For some years a three-inch oak plank has been fayed upon the upper side of the keelson, and the bolts driven through that likewise.

Stemson is oak sawn to its siding and moulding, then trimmed and fayed to the apron, and scarfed with a hook or douls into the fore part of the keelson. The bolts through the *bressal-hooks* must be considered, and one or two bolts may then be driven through between them.

Sternson-knee is oak sawn to its siding and moulding, then trimmed and fayed against the transoms and upper side of the dead-wood, and scarfs with a hook, or douls into the after-piece of the keelson. It is bolted to the transoms and stern-post as the keelson, of which it is a continuation.

Wales are next wrought, and the *thick-stuff* below them: they should be fastened with dumps only for the present, as the tree-nail holes, which are double and single alternately in every timber, and should be left open as long as possible, for the admission of air. A doull in the timber next each butt in the wales, in the strake above and below it, has been lately introduced in the navy, as an additional security. The wales and diminishing strakes are then dubbed down fair, and large-cleats nailed at the fore part of every port, to which the ship is substantially shored.

Planking.—The bottom is next planked down sufficiently low to work the orlop-clamps. See *Planking expanded*, Plate VIII.

Inboard Clamps, Thick-stuff, &c.—These are wrought similar to the outside stuff above. The clamps to the sheer of the deck, and their upper sides to the round-up of the beam, and the lower edge, square to the timbers, unless they work down to the ports; then, in wake of the ports, the lower sides are trimmed level, and between the ports square to the timbers. Clamps over ports are bearded from half their depth to one inch less in thickness on the under side, excepting over the ports, where the wood is left on, for the muzzles of the guns to house to; and the butts are douelled as the wales.

The thick-stuff is to be wrought with a square close edge over the joints of the timbers; and the spirkittings are to have a seam allowed, agreeable to the thickness with the outside stuff, which should be a full sixteenth to every inch in the thickness.

Beams are sawn to their siding, and to the moulded depth square to the siding. Beams of two, three, or four pieces are scarfed together; and if in three or four pieces, the middle pieces may be fir, excepting in the hatchways.

Beams in two pieces have a scarf one-third the whole length of the beam. Beams in three pieces have the middle pieces and the end pieces each half the length of the whole beam, the middle piece having a scarf each way to take the arms. Beams made of four pieces have two middle pieces, each similar to the former: the arms and middle pieces are each to be in length three-sevenths of the whole length of the beam. See *Gun-deck*, Plate VI.

Beams are either tabled or douelled, and bolted together at the scarfs: if tabled, the lengths of the tables are once and a half the moulded depth in length, and divided at the middle of the depth; and where the wood is taken out on the upper side, it is left on the lower side, and so alternately; taking the wood out on the upper side at the table next the butt, as it will the better hang and support the lip. At each lip, beyond the tables, is a coak about six inches long; and next to that is a straight lap, about the same length.

The beams, when cut off to their length, have their ends mouthed and charred, and then are let down about one inch

SHIP-BUILDING.

into the clamps, at their several stations, at right angles with the middle line; keeping their upper sides out of winding with the beam line.

Knees.—The beams, at their ends, are connected to the sides by knees, or other substitutes for knees. The knees are fawn or trimmed to their siding, and fayed to the side, taking as little wood as possible out of the throat the moulding way, as the greatest strength of the knee is there. Each knee tapers towards the toe to which it is sided; and the substance in the throat should be about twice and a half the siding, and not to admit of any chock that would reduce the knee at any part less than the siding.

Each knee should have two douls in the beam-arm, and from three to four bolts; and the two upper bolts in the side-arm of the hanging-knees should be kept up as high as possible, and the others equally spaced to the toe, and bored as square to the side as the seams outside will allow.

In those parts of the ship afore and abaft, where wooden knees cannot be procured of kindly growth, (for upon that depends the strength,) knees of iron are generally placed. These, although much used, particularly in merchant-ships, cannot be so fully depended upon as those of wood, because they cover less surface, are no wise flexible, nor can the bolts be driven so tight in iron as in wood. If, therefore, the ship strains, they must inevitably work loose. Again, the holes must be bored in the direction in which the knees are punched, so that where iron knees are intended to be placed, oak fillings should be driven between the timbers; otherwise the bolts may come in the openings, which is inadmissible. Besides this, the bolts may come in the seams of the outside plank; when it so happens, the best way is to cut out a piece, and clench the bolt upon the timbers.

Bolts in wooden knees are mostly driven from the outside, and clenched upon the knees inside; but bolts in iron knees are driven from the inside, with collar or stout heads, because upon the head depends its fastening; or if the bolts be of copper, they must have a ring under the head, and the head spread or made large in driving. All bolts driven from the inside should be carefully clenched upon a ring, let flush into the plank, by means of a machine or centre-bitt for that purpose, and the points under water carefully caulked after the ring is let in.

Wooden knees having become scarce for some years past, many substitutes have been attempted; and iron knees, or rather knees formed of iron and wood conjointly, are certainly best when properly applied. See *SUBSTITUTE*.

Standards, either on the deck or to the sides of orlop beams, are so similar to knees, as to require no further description.

Breast-hooks, steps, and crutches, are oak fawn to their sidings, then moulded. The deck-hooks are fayed to the timbers, the others to the inside stuff. The holes for the bolts are bored alternately, near the edges, equally asunder, and square with the body. Breast-hooks, steps, and crutches, are affixed in the moulding by clocks; and the deck-hooks may be affixed by large eakings, worked behind them. All the chocks, &c. are douelled or tabled, and ought on no account to have less wood or substance than their siding, clear of the chock.

Riders are oak fawn to their siding, moulding, and bevellings; then fayed to their respective places, as follows.

Floor-riders in two pieces have a cross-chock fayed over the heels, with a hook and butt scarf; their heels run down to the limber-strake, and the heads run upwards between the joints of the floor-heads and first futtock-heads.

First futtock-riders fay close to the sides of the floor-riders, and their heels extend downwards within four feet

of the keelson; their heads run upwards between the joint of the first futtock-head and under side of the orlop-beams, with a cross-chock fayed over the heels as the floor-rider.

Second futtock-riders fay close to the sides of the first futtock-riders, and scarf with a hook-scarf under the head of the floor-riders, or connect thereto with a chock. Their heads run up within two inches of the under side of the gun-deck beam, and are fawn with a swell at the orlop-beam, to which they tail sideways; and they bolt through the beam and the adjoining riders fore and aft.

Third futtock-riders fay and bolt to the sides of the second futtock-riders, and are fawn with a swell, as the above, at the gun-deck beam. The heads run up within two inches of the under side of the upper deck beam, or middle deck, in three-deck ships; and the heels come within two inches of the upper side of the orlop-beam.

Ships in the navy at present have no inside stuff below the clamps, but have their timbers filled in between with dry slices of oak, driven in tight and caulked; and the riders are fayed over the timbers, and stand diagonally at the angle of forty-five degrees.

The *knee of the head* is oak, each piece fawn to its siding, agreeable to the tapered battens, where they intersect. The main piece should make the lower part of the knee, and run up to the fore part of the stem, to which it fays high enough for a hole to be cut in it to receive the main-stay collar. The front piece runs up to seat the figure, and should be broad enough to take the bobitay holes, and the lower end step in the main piece about one foot below the load draught of water. Another piece must be provided to make the lacing to secure the figure. The other pieces between may then be provided, as most convenient, marking on the mould the shape of each piece, as provided; the surface of each piece is then fayed close together, and douelled. The knee is hoisted up into its place, and then bolted with seven or more bolts through the stem and apron, and sometimes through the deck-hooks.

Cat-heads are now fawn straight, sideways, and plumb, moulded to flight, in ships of the line, to five inches in a foot above a level line without the bow; and in frigates and smaller vessels, to the angle of forty-five degrees. The inner end fays up to the under side of two or more of the fore-castle beams, so as to stand square with the bow.

Supporters of the cat-heads are knees of oak fayed to the under side of the cat-head, and the arm to the side to stand perpendicular; the upper arm bolted through the cat-head, and the other through the side.

Rudder.—The main piece to be oak fawn to its siding, and the upper part to the given dimensions, and the lower part to be moulded as broad as the piece will admit. Whatever the main piece may require to complete its fore-side may be elm, fayed close to the main piece, and douelled. The other pieces to complete the surface of the rudder may be fir, fayed close to the main piece and each other, and douelled. The whole is then trimmed straight through to its thickness, and bolted together between the straps of the pintles. The back is then fayed on, and fastened to the aft-side, and the sole at the heel, when cut off to its length, which is nine inches short of the under side of the keel. The fore-side may be then bearded from the middle to two-fifths the thickness, lined down on each edge; but this has been found to cut or wound the main piece so much at the upper pintle, that, lately, the aft-side of the stern-post is likewise bearded at the upper end; and consequently the fore-side of the rudder so much the less. The pintles may next be let on thus: the braces being let on to the stern-post, and square from the aft-side, a staff of the whole length

length is run down through the holes of the braces. Now mark the upper sides of the braces correctly on the staff with a pencil, or both under and upper sides will be best. Then mark on the staff the upper side of the wing-transom, and the under side of the deck-transom above; also the upper side of the deck; and, lastly, the under side of the keel. Next apply the staff on the fore-side of the rudder, and exactly mark off the upper sides of the braces in the middle line, likewise the transoms and deck. Then square down, from the fore-side of the rudder, the upper side of each brace, which, it may be observed, is the under side of the pintles. Now set upwards the breadth of the straps of the pintles, and the scores may be taken out till their crowns come flush with the bearding, and the middle of the pintles ranges well with the middle line: thin copper is drest in the scores under the pintles. Scores or throatings are then gouged out, under the pintles, sufficiently large for hanging the rudder, which may be formed by a piece of sheet-lead made to the crown of each brace, and traversed round its respective pindle. Let there be sufficient room in the scores to allow for the sheathing; and that the rudder may hang easily, all the scores must be made to the length of the lower one; that pindle being two inches longer than the others. The score nearest the load water-line is opened on one side to fit in the wood-lock, which prevents the rudder from unshipping. Ships built in the North have the pintles put into the braces, and the rudder put together in that situation, so that it cannot be unhung until throatings are cut to clear it of the braces.

After the braces are let on to the stern-post, it is best to try all the pintles in them, and see that they work easily in the braces, and square from the stern-post. Then their upper sides may be marked on the stern-post, and set off on the rudder, as before directed, without the possibility of error.

The head, if not round-headed, is thirded and bearded back about three-quarters of an inch, and the edges taken off to a bold round. The holes for the tillers may now be cut through the lower hole three inches clear of each transom, and the lower part of the upper hole three inches clear of the deck: lastly, the head-hoops may be driven on.

Amongst other useful machines for drawing bolts out of ships (see BOLTS), the following was invented by Mr. William Hill. See Transactions of the Society for the Encouragement of Arts, &c. vol. x.

"First, The use of this machine is to draw the keelson and dead-wood bolts out, and to draw the knee of the head bolts. Secondly, The heads of the keelson bolts heretofore were all obliged to be driven through the keelson, floor-timbers, and keel, to get them out: by this means the keelson is often entirely ruined, and the large hole the head makes materially wounds the floors; and frequently, when the bolt is much corroded, it scarfs, and the bolt comes out of the side of the keel. Thirdly, The dead-wood bolts, that are driven with two drifts, are seldom or never got out, by which means the dead-wood is condemned, when some of it is really serviceable. Fourthly, In driving the knee of the head bolts, sometimes the knee starts off, and cannot be got to again, but is furred up; but with this machine it may be drawn to again."

In Plate XIV. *Ship-building*, fig. 3, A, A represent two strong male screws, working in female screws, near the extremities of the cheeks, against plates of iron, E, E. C C is the bolt to be drawn, which, being held between the chaps of the machine at D D, is, by turning the screws by the lever B, forced out of its hold. F, F are two dogs, with hooks at their lower extremities, which, being driven into the plank, serve to support the machine till the chaps

have got fast hold of the bolt. At the upper part of these dogs are rings passing through holes in a collar, moveable near the heads of the screws.

Fig. 4. is a view of the upper sides of the cheeks, when joined together; a, a, the holes in which the screws work; b, the chaps by which the bolts are drawn. Fig. 5, the under side of the cheeks; a, a, the holes in which the screws work; b, the chaps by which the bolts are drawn, and where the teeth that gripe the bolt are more distinctly shewn. Fig. 6, one of the cheeks separated from the other, the letters referring, as in figs. 4 and 5.

SHIPFUND, SHIPPOND, or *Schiffsfund*, in *Commerce*, a large weight in Holland, Germany, Denmark, and Sweden, containing a different number of pounds in different places. At Amsterdam the shippond contains 3 centners, 20 lyfponds, $37\frac{1}{2}$ steen or stones, and 300 lbs. A lyfpond is 15 lbs., and a stone 8 lbs. At Berlin a ship-laft contains 12 shipfunds, each of 20 lyfponds, or 280 lbs.; in all 3360 lbs.: but a laft of falt is 3260 lbs. At Hamburg a shipfund contains $2\frac{1}{2}$ centners, 20 lyfponds, or 280 lbs.: a lyfpond is 14 lbs., and a centner 112 lbs. Hamburg weight. At Copenhagen the shippond contains $3\frac{1}{2}$ centners, 20 lyfponds, or 320 lbs.; a lyfpond is 16 lbs., and a centner 101 lbs.

SHIPLEY, JONATHAN, in *Biography*, an English prelate, was born in the year 1714, and was educated at Christ-church, Oxford, where he wrote some verses on the death of queen Caroline; and in 1738 he took his degree of M.A. Soon after this he entered into holy orders, and obtained a living. In the year 1743 he was installed prebendary of Winchester, and in 1748 appointed chaplain to the duke of Cumberland, whom he accompanied abroad. In 1749 he became canon of Christ-church, and in 1760 dean of Winchester. In 1769 he was advanced to the bishopric of St. Asaph. He died in 1788. He was author of poems, and sermons on public occasions.

SHIP-MONEY, an imposition which was anciently charged upon the ports, towns, cities, boroughs, and counties of the realm; by writs commonly called *ship writs*, under the great seal of England, for the providing and furnishing certain ships for the king's service.

This imposition was revived by king Charles I. in the years 1635 and 1636; but by stat. 17 Car. I. it was declared to be contrary to the laws and statutes of the realm, claim of right, liberty of the subject, &c.

SHIPPANDSTOWN, in *Geography*, a town of Virginia, on the south side of the Patowmack; 40 or 50 miles from Alexandria.

SHIPPENSBURGH, a post-town of Pennsylvania, in Cumberland county, on a branch of Conadogwinnet creek, which discharges itself into the Susquehannah; containing about 200 houses, chiefly built of stone, 1159 inhabitants, and three meeting-houses, one for Seceders, one German, and one Methodist. It derives its name from its proprietor John Shippen, esq. of Philadelphia, who leased out the place in small house-lots on ground-rents from two to four dollars a year; 146 miles W. of Philadelphia.

SHIPPER, SKIPPER, or *Schipper*, a Dutch term, signifying the master of a ship.

We also use the word, popularly, for any common seaman.

SHIPPIGAN ISLAND, in *Geography*, an island in the gulf of St. Lawrence, on the south side of Chaleur bay, S.W. of, and separated by a narrow channel from, Miscow island.

SHIPPING denotes a multitude of vessels.

SHIP-SHAPE, in *Sea Language*, denotes the fashion of a ship, or the manner of an expert sailor: thus, they

lay, the-mast is not rigged *ship-shape*, and trim your sails *ship-shape*.

SHIPSTON-UPON-STOUR, in *Geography*, a market-town in the upper division of the hundred of Ofwold-flow, and county of Worcester, England, is situated in a district entirely detached from the body of the county, and close to the left bank of the river Stour, whence is derived the latter part of its name. The houses here are chiefly built of stone; but notwithstanding this advantage, the town cannot boast much of its appearance, many of them being small, and thatched with straw. Several attempts have been made to establish manufactures here, but without any permanent success. The market-day is Friday, weekly; and there are two annual fairs, one on the 22d of June, and the other on the first Tuesday after the 10th of October; both of them for horses, cows, and sheep. The manor of Shipston formerly belonged to the priory of Worcester, and is now part of the possessions of the dean and chapter. The church is only a chapel of ease to the mother church of the parish of Tredington, which extends about nine miles in length and two in breadth. According to the population returns of 1811, the parish contains 297 houses, and 1377 inhabitants, of whom about 1000 reside within the township of Shipston-upon-Stour. Nash's Survey of Worcester-shire, 2 vols. fol. Beauties of England and Wales, vol. xv. by Mr. Laird, 8vo. 1813.

SHIPTON, a flourishing township, of excellent land, in Lower Canada, on the east bank of the St. Francis; 20 miles N.W. of Ascot, and containing about 356 inhabitants.

SHIPWRECK. See **WRECK**.

SHIRAVERT, in *Geography*, a town of Persia, in the province of Ghilan; 30 miles S. of Astara.

SHIRBEY, a town of Syria, the residence of a scheik; 15 miles E. of Aleppo.

SHIRBORN, a river of England, in the county of Warwick, which runs into the Sow.

SHIRE, **SCYRA**, originally Saxon, *scir*, or *scire*, formed from *scýran*, to divide; a part or portion of the land, called also a county; which see.

SHIRE-Clerk, he that keeps the county court; and his office is so incident to that of the sheriff, that the king cannot grant it away.

SHIRE-Man, was anciently the judge of the shire, by whom trials for land, &c. were determined.

SHIRE-Mote, in our *Old Writers*, an assembly of the county or shire at the assizes, &c. See **SCYREGEMOT**.

SHIRE-Reve. See **SHERIFF**.

SHIRE, *Knights of the*. See **KNIGHT**.

SHIREWOOD or **SHERWOOD Forest**, in *Geography*, is an ancient and extensive forest, comprehending a large portion of the county of Nottingham, England. Thoroton, in his History of Nottinghamshire, says that it stretches into the hundreds of Broxton, Thurgarton, and Bassetlaw; and measures about twenty-five miles in length, by from seven to nine in breadth, an extent which seems to agree with its ancient boundaries, as stated in a perambulation made in the sixteenth year of Henry III. The period when this district was originally constituted a forest is unknown, but that event must have occurred previous to the time of Henry II., as in the first year of that monarch's reign, it appears from official records, that William Peverel was called upon to answer "De Placitis Forestæ in Comitatu Nottingham." At that time Peverel had the whole profit and command of this forest; but it must soon afterwards have reverted to the crown, for in 1161 the sheriff of the county prays to be discharged of "4l. in vasto forestæ;" and in 1163 he prays for a similar discharge, and for the discharge of "40l. paid to

the canons of Shirewood for alms." In the Forest books is inserted a copy of a charter by king John, granting to Matilda de Caux, and Ralph Fitzstephen her husband, and their heirs, all the liberties and free customs which any of the ancestors of the said Matilda, lords of Laxton, had held in Nottinghamshire, including the forest of Shirewood. The same rights afterwards fell to John Birking, as heir-general to Matilda de Caux; and in 1226 the forest is mentioned as being then in possession of his son; but this line failing, it descended to the family of the Everingham, who having lost their possessions by forfeiture in the reign of Edward I. it reverted to the crown. Since that event, its civil jurisdiction has been generally vested in the sheriffs of the county, and its forest jurisdiction only granted to various individuals among the nobility and gentry, as special marks of royal favour. An inquisition taken before Geoffrey de Langley, in the reign last mentioned, illustrates the customs of this forest. By it the chief keeper appears to have been obliged to have three deputy keepers for a like number of districts, in order to attach all trespasses, and present them at the attachment before the verdurers. In the first keeping, which lay between the rivers Lene and Doverbeck, he was to have one forester riding with a page, and two foresters on foot; two verdurers, and two agisters. This keeping contained the three hays of Baskwood, Lindeby and Willay. The High Forest, including the hays of Birkland and Bilhagh, and the park of Clipstone, formed the second keeping; and here were two foresters riding, with two pages and two agisters. The third keeping, Rumwode, had one forester on foot; two woodwards, one at Carburton, and the other at Budby; and the same number of verdurers and agisters. The chief keeper was further bound to have a page bearing his bow, whose duty it was to gather "chiminage," which is usually supposed to have been a tax for the formation and preservation of roads.

By the last survey made of this forest in 1609, it was parcelled out into three walks, called the north, middle, and south walks. The forest officers, under the superintendence of the chief justice in eyre north of Trent, are a lord warden, a bow-bearer and ranger, four verdurers, a steward, and nine keepers, besides two sworn woodwards for Sutton and Carleton. The surveyor-general of the woods has likewise a jurisdiction over this forest, as far as regards the wood and timber of the crown. He has a deputy in the forest, who has a fee-tree yearly, and a salary of 20l. Thorney-wood Chace, though a branch of this forest, is distinct from it in jurisdiction, having been granted by queen Elizabeth to John Stanhope, esq. and his heirs, as hereditary keepers. This chace comprehends a large portion of the south walk, and was formerly well stocked with fallow deer; but these, of late years, have greatly diminished in number.

Of the ancient woodland in this extensive tract, little remains except in the hays of Birkland and Bilhagh, which form an open wood of large old oaks, covering about 1500 acres of ground; but modern plantations have lately increased rapidly, and there are, in different districts and parks, a few trees, remarkable alike for their great age and magnitude. In Clipstone park is an immense oak, called the Parliament oak, from a tradition that a parliament was assembled here by Edward I.; and in the same park is another tree, styled the Broad oak, the bole of which measures 27½ feet in circumference. Many of these venerable oaks may likewise be seen in Welbeck park, on the skirts of the forest, where some of them are upwards of 34 feet round. Rooke, in his "Sketch of the Forest," mentions a recent discovery of a very curious mode of ascertaining the great antiquity of some of these trees. He tells us, that in cutting down some timber in Birkland

Birkland and Bilhagh, letters were found cut or stamped in the body of the trees, denoting the king's reign in which they were so marked. The cyphers were of king John, James I., and William and Mary. The mark of John was eighteen inches within the tree, and about a foot from the centre; it was cut down in 1791; but the middle of John's reign was 1207, from which, if we subtract 120, the number of years requisite for a tree of two feet diameter to arrive at that growth, it will make the date of its planting 1087.

The forest of Shirewood was, in ancient times, frequently the scene of royal amusement. As early as the reign of Henry II., Mansfield was the general residence of the court upon these occasions, and it was in this vicinity, according to tradition, that Henry made acquaintance with the miller of famous memory, sir John Cockle. This forest was likewise the retreat of another personage, equally celebrated in the chronicle of ballad, the illustrious Robin Hood, who, with little John, and the rest of his associates, making the woody scenes of it their asylum, laid the whole county under contribution. Thoroton's History of Nottinghamshire, republished, with additions, by John Throsby, 3 vols. 4to. 1790. Beauties of England and Wales, vol. xii. by Mr. Laird, 8vo. 1813.

SHIRINKI, one of the Kurile islands, about 26 versts from Poromushir. On it rises a round mountain-top; and about it, on the coast, walls of rock and loose brittle stone, but it has no sandy bay, nor any safe inlet for shipping. The island is nearly as broad as it is long, and may be about 40 versts in circumference. It is only inhabited by sea-lions and other marine animals, with some red foxes and sea-fowls that have been carried thither with the ice. There is no wood on the island, except a few sticks of the mountain pine and some elder bushes; and it has neither a stream nor a spring of water. The rocks are very much disposed to break and fall in fragments. N. lat. $50^{\circ} 40'$. E. long. $138^{\circ} 3'$.

SHIRLEY, ANTHONY, in *Biography*, second son of Thomas Shirley of Weston, in Suffex, a celebrated traveller, was born in 1565. He studied at Oxford, where he took his bachelor's degree in 1581, after which he joined the English troops, which, at that time, were serving in Holland. In 1596 he was one of the adventurers who went to annoy the Spaniards in their settlements in the West Indies, and on his return he was knighted. After this he was sent by the queen into Italy, in order to assist the people of Ferrara in their contest with the pope: before, however, he arrived, all the disputes were accommodated, and peace was signed; he accordingly proceeded to Venice, and travelled from thence to Persia, where he came in great favour with Shah Abbas, by whom he was sent ambassador to England in 1612. By the emperor of Germany he was raised to the dignity of count, and by the king of Spain he was appointed admiral of the Levant seas. He died in Spain about the year 1630. There is an account of his West Indian expedition in the third volume of Hacluyt's Collection, under the following title: "A true Relation of the Voyage undertaken by Sir Anthony Shirley, Knight, in 1596, intended for the Island San Tome, but performed to St. Jago, Dominica, Margarita, along the Coast of Tierra Firma to the Isle of Jamaica, the Bay of Honduras, Thirty Leagues up Rio Dolce, and homewards by Newfoundland, with the memorable Exploits achieved in all this Voyage." His travels into Persia are printed separately, and were published in London in 1613; and his travels over the Caspian sea, and through Russia, were inserted in Purchas's Pilgrimages.

SHIRLEY, JAMES, a poet and dramatic writer, was born in London about the year 1594. He received the early part of his education at Merchant Taylors' school, from which place he was removed to Oxford. He was, on ac-

count of his talents, patronized by Dr. Laud, who, however, would not consent to his taking orders, by reason of his being disfigured by a large mole on his cheek, which, in his estimation, according to the canons of the church, rendered him unfit to officiate in clerical duties. Shirley therefore left Oxford without a degree; but he afterwards removed to Cambridge, and meeting with no farther obstacle, he took orders, and obtained a curacy. His religious creed was not sufficiently settled, and he went over to the church of Rome, abandoned his cure, and opened a grammar-school at St. Alban's. After some time he deserted this employment, and became a writer for the stage. His productions were successful, and he acquired a reputation which caused him to be taken into the service of queen Henrietta-Maria. When the civil war broke out, he accompanied the earl of Newcastle in his campaigns, and also assisted him in the composition of several of his plays. On the ruin of the king's cause he came to London, and resumed his occupation of a school-master, in which he met with considerable encouragement, and he shewed his attention to the duties of his office, by publishing some works on grammar.

During the Commonwealth, theatrical amusements being suspended, Shirley had no room in which he could display his dramatic talents; but after the Restoration, several of his pieces appeared again on the stage. The death of this author is thus described: his house in Fleet-street being burnt in the great fire of London, in the year 1666, he was forced with his wife to retreat to the suburbs; in consequence of the loss and the alarm which this occasioned, both himself and wife died within a few hours of each other, and they were buried in the same grave.

Mr. Shirley was author of thirty-seven plays, consisting of tragedies and comedies, and of a volume of poems, published in 1646. He had the reputation of being the chief among the second-rate poets of his time, but his works have long since disappeared from the stage, and they are scarcely ever referred to by more modern authors, yet there have been critics who thought highly of them. Dr. Farmer, in his Essay on the Learning of Shakspeare, says the imagination of Shirley is sometimes fine to an extraordinary degree. He assisted Mr. Ogilvie in his translation of Homer and Virgil, by writing notes on them.

SHIRLEY, in *Geography*, a township of America, in Massachusetts, in the N.W. part of Middlesex county; 41 miles N.W. of Boston: incorporated in 1753, and containing 814 inhabitants.—Also, a township of Pennsylvania, in Huntingdon county, containing 862 inhabitants.

SHIRON, or SCHIRVON, a town of Thibet; 120 miles N. of Catmandu. N. lat. $30^{\circ} 10'$. E. long. $85^{\circ} 5'$.

SHIRVAN. See SCHIRVAN.

SHISNIEZ, a town of Poland, in Volhynia; 12 miles N. of Constantina.

SHITAKOONTHA, a name of the Hindoo deity Siva. It means the *blue-throated*; and the fable accounting for the name is often alluded to in the writings of that fanciful people. It relates, that when the ocean was churned, in the manner described under our article KURMAVATARA, poison was produced among the fourteen precious articles resulting from that marvellous operation. The word, as well as poison, means medicinal drugs. This was swallowed by Siva.

"To soften human ills, dread Siva drank

The poisonous flood that stained his azure neck."

In the songs of Jayadeva, translated by sir W. Jones, in praise of Vishnu and Lakshmi, under their names of Krishna and Radha, the following passage occurs, which we are induced

duced to extract as an instance of the playful gaiety of Hindoo poetics, and the prevalence of mythological allusions, in all their writings. Heri and Narayana, we may premise, are names of Vishnu; and Padma, or the Lotos, of Lakshmi.

"Whatever is delightful in the modes of music; whatever is divine in meditations on Vishnu; whatever is exquisite in the sweet art of love; whatever is graceful in the fine strains of poetry;—all that let the happy and wise learn from the songs of Jayadeva, whose soul is united to the foot of Narayana. May that Heri be your support, who expanded himself into an infinity of bright forms, when, eager to gaze with myriads of eyes on the daughter of the ocean, he displayed his great character of the all-pervading deity, by the multiplied reflections of his divine person in the numberless gems on the many heads of the king of serpents, whom he chose for his couch: that Heri, who, removing the lucid veil from the bosom of Padma, and fixing his eyes on the delicious buds that grew on it, diverted her attention by declaring, that when she had chosen him as her bridegroom, near the sea of milk, the disappointed husband of Parvati drank in despair the venom which dyed his neck azure." Jones's Works, vol. x. Af. Ref. vol. iii.

The many-headed king of serpents is named Seshha, a frequent subject of poetical exuberance. See SESHHA.

Of the blue-necked Siva, Nilakantha is another name, of similar meaning as that at the head of this article; and which indeed occurs oftener than Shitakantha, or Shitakoontha.

SHITTAT, in *Geography*, a town of Arabia Deserta; 50 miles W.N.W. of Melched Ali.

SHITTEN BAY, a bay on the W. coast of the island of St. Christopher.

SHIVAL, a town of Hindoostan, in Vissiapour; 25 miles E. of Baddammy.

SHIVERAPILLY, a town of Hindoostan, in the circle of Cicacole; 20 miles W. of Cicacole.

SHIVERS, in a *Ship*, the seamen's term for those little round wheels in which the rope of a pulley or block runs. They turn with the rope, and have pieces of brass in their centres, which they call the *coak*, with holes in them, into which the pin of the block goes, and on which they turn.

These shivers are usually of wood, but some are of brass, as those in the heels of the top-masts. See SHEAVE.

SHIVERS, in *Rope-making*, the foul particles taken from the hemp, when hatchelling.

SHIVERING, the state of a sail when the wind is too oblique to fill it, so that it flutters about. This must be the case when a vessel is put about, till the sails are filled again with the wind.

SHIVERY SALT, a name given by the salt-workers to a sort of salt, very little different from the common brine-salt. See SALT.

SHIUMLA, in *Geography*, a town of Bulgaria, in the sangiacat of Driitra. In this place, thought by the Turks to be impregnable, they were defeated by the Russians with terrible slaughter; 62 miles E. of Varna. N. lat. 43° 10'. E. long. 26° 27'.

SHIZAR, a town of Syria, in the pachalic of Aleppo; 15 miles S.E. of Famieh.

SHOAD, in *Mining*, a term for a train of metalline stones mixed with earth, sometimes lying near the surface, sometimes at considerable depths, but always serving to the miners as a proof that the load or vein of the metal is thereabout. The deeper the shoad lies, the nearer is the vein.

SHOAD-Stones, a term used by the miners of Cornwall,

and other parts of this kingdom, to express such loose masses of stone, as are usually found about the entrances into mines, sometimes running in a straight course, from the load or vein of ore to the surface of the earth.

These are stones of the common kinds, appearing to have been pieces broken from the strata, or larger masses, but they usually contain mundic or marcasitic matter, and more or less of the ore to be found in the mine. They appear to have been at some time rolled about in water, their corners being broken off, and their surface smoothed and rounded.

The antimony mines in Cornwall are always easily discovered by the shoad-stones, these usually lying up to the surface, or very nearly so; and the matter of the stone being a white spar, or debased crystal, in which the native colour of the ore, which is a shining blueish-black, easily discovers itself in streaks and threads.

Shoad-stones are of so many kinds, and of such various appearances, that it is not easy to describe or know them: but the miners, to whom they are of greatest use in the tracing, or searching after new mines, distinguish them from other stones by their weight; for if very ponderous, though they look ever so much like common stones, there is great reason to suspect that they contain some metal. Another mark of them is their being spongy and porous; this is a sign of especial use in the tin countries, for the tin shoad-stones are often so porous and spongy, that they resemble large bodies thoroughly calcined. There are many other appearances of tin shoads, the very hardest and firmest stones often containing this metal.

When the miners, in tracing a shoad up hill, meet with such odd stones and earths, that they know not well what to make of them, they have recourse to vanning, that is, they calcine and powder the stone, clay, or whatever else is supposed to contain the metal; and then washing it in an instrument, prepared for that purpose, and called a *vanning shovel*, they find the earthy matter washed away, and of the remainder, the stony, or gravelly matter lies behind, and the metalline matter at the point of the shovel. If the person who performs this operation has any judgment, he easily discovers not only what the metal is that is contained in the shoad, but also will make a very probable guess at what quantity the mine is likely to yield of it in proportion to the ore. Phil. Trans. N° 69. Price's Mineralogia, p. 124, &c.

SHOAL, in *Sea-Language*, is the same as *shallow*, and is applied to flats in the water.

They say it is *good shoaling*, when a ship sailing towards shore, they find by her sounding it grows shallower and shallower by degrees, and not too suddenly; for then the ship goes in safety.

SHOAL Inlet, in *Geography*, a channel between two small islands on the coast of North Carolina. N. lat. 34° 5'. W. long. 77° 58'.

SHOALNESS, a low cape on the west coast of North America. Captain Cook met with some Indians on the coast, near this cape, who came off to the ships in canoes, expressing, as he conceived, their pacific intentions by hallooing and opening their arms, as they cautiously advanced. At length some of them approached near enough to receive some trifles that were thrown to them. This brought on, says captain Cook, "a traffic between them and our people, who got dresses of skins, bows, arrows, darts, wooden vessels, &c.; our visitors taking in exchange whatever was offered them. They seemed to be the same kind of people that we had lately met with along this coast; wore the same ornaments in their lips and noses, but were far more dirty, and not so well clothed. They appeared to be wholly unacquainted with people like us;

us; knew not even the use of tobacco; nor was any foreign article seen in their possession, unless a knife may be considered as such. This indeed was no more than a piece of common iron fitted into a wooden handle. They however knew the value and use of this instrument so well, that it seemed to be the only article they wished for. Most of them had their hair shaved or cut short off, leaving only a few locks behind, or on one side. As a covering for the head they wore a hood of skins, and a bonnet apparently of wood. One part of their dress was a kind of girdle, very neatly made of skin, with trappings depending from it, and passing between the legs, so as to conceal the adjoining parts. By the use of such a girdle, it should seem that they sometimes go naked, even in this high latitude, for they hardly wear it under their own clothing. The canoes were made of skins, like all the others we had lately seen; except that these were broader, and the hole in which the man sits was wider than in any I had before met with." N. lat. 60°. E. long. 108° 12'.

SHOALS, *Isles of*, or, as they were formerly called, **SMITH'S Islands**, a group of small islands, situated on the coast of New Hampshire, in America. The line that divides the district of Maine from New Hampshire passes between these islands, leaving part in one of these states and part in another. They contain about 140 poor fishermen, who are supplied with a religious teacher by the society for propagating the gospel. They have a meeting-house, which serves as a landmark for seamen, and a parsonage-house, erected by charity. These islands consist chiefly of a barren rock, with little soil. N. lat. 42° 59'. W. long. 70° 33'.

SHOAL-WATER BAY, a bay on the N.E. coast of New Holland, W. of Cape Townshend.—Also, a bay on the W. coast of North America. N. lat. 46° 50'. W. long. 124° 10'.

SHOAR, or **SHORE**, a prop, or counterfort, set up to support any thing of weight which leans on one side. See **BUTTRESS**.

SHOARS, or *Shores*, in *Ship-building*, are fir-baulks, spars, or pieces of timber, fixed under the ribbands, or against the sides and bottom of the ship, to prop or support her whilst building or repairing.

SHOBA, in *Geography*, a town of some note in Africa, in the kingdom of Dar-fur; 42 miles or 2½ days' journey W.S.W. of Cobbe. This place is said to be well supplied with water, and has near it some chalk-pits, which, when Mr. Browne visited them, were almost exhausted for the purpose of adorning the royal residence, and some others, with a kind of white-wash. In Shoba reside some Jolabs; the rest of the people are Ferians, and occupied in other pursuits.

SHOCK, or **SCHOCK**, in *Commerce*, a German word expressing 60 pieces.

SHOE, in *Geography*, a small island in the Pacific ocean, near the coast of Waygoo. S. lat. 0° 1'. E. long. 130° 53'.

SHOE Indians, Indians of North America, in an island of lake Missouri. N. lat. 48° 15'. E. long. 105° 45'.

SHOE, a covering for the foot, usually of leather.

Its structure, though the object of a particular art, is too popular to need explaining.

Its history is more obscure. Bend. Baudoin, a shoe-maker by profession, has a learned treatise of the ancient shoe, "*De Solea Veterum*," where the origin, matter, form, &c. thereof, are particularly inquired into.

Baudoin maintains, that God, in giving Adam skins of beasts to clothe him, did not leave him to go bare-footed, but gave him shoes of the same matter; that, after raw skins, men came to make their shoes of rushes, broom, paper, flax,

filk, wood, iron, silver, and gold; so different has their matter been. Nor was their form more stable, with regard either to the shape, colour, or ornaments; they have been square, high, low, long, and quite even, cut, carved, &c. Pliny, lib. vii. c. 56, tells us, that one Tychius, of Bœotia, was the first who used shoes.

M. Nilant, in his remarks on Baudoin, observes, that he quotes Xenophon wrongly, to shew that even in his time they still wore shoes of raw skins.

Xenophon relates, that the ten thousand Greeks, who had followed the young Cyrus, wanting shoes in their retreat, were forced to cover their feet with raw skins, which occasioned them great inconveniencies.

Nilant will not even allow, that the shoes of the country people, called *carbatinae*, and *peroneæ*, were of crude skin, without any preparation.

The patricians, among the Romans, wore an ivory crescent on their shoes: Heliogabalus had his shoes covered over with a very white linen, in conformity to the priests of the sun, for whom he professed a very high veneration; this kind of shoe was called *adæ*, *udo*, or *odo*. Caligula wore shoes enriched with precious stones. The Indians, like the Egyptians, wore shoes made of the bark of the papyrus. The Turks always put off their shoes, and leave them at the doors of the mosques.

SHOES made by rivetting instead of sewing. A patent was taken out for this invention in 1809, by Mr. David Mead Randolph, an American. In his specification, he describes that the rivetting which he proposes to substitute for sewing, is only applicable to the soles and heels of boots or shoes, all the other parts being made in the usual manner. The *last* which is used for this method is the only implement which demands a particular description. It is first made in wood, of the same figure as the common last, and adjusted in the usual manner to the size and shape of the shoe which is intended to be made or put together upon it. The lower part or sole of the last is then covered with a plate of iron or steel, about the same thickness as a stout sole leather: this plate, being formed to the exact shape which is desired, is fastened down upon the wood by screws or rivets. The iron plate has three circular holes made through it, one at the toe, another about half way between the toe and the heel, and a third at the heel: the holes are about an inch in diameter, and being filled up with wooden plugs, and cut down even with the surface of the iron, they will admit the points of temporary nails to be driven through the leather sole to penetrate into the wood, and fix the sole upon the last whilst the work goes on.

The making of the shoe is conducted in the usual manner, until it is ready for putting on the last. To do this, the inner sole is put upon the iron sole of the last; then the upper-leathers are put upon the opposite part, and the edges of the leather are turned down over the edges of the inner sole: the outer sole is then applied over the turning-down, and fastened in a temporary manner upon the last, by driving one or two nails, through both soles, into the wooden plugs before mentioned, which fill up the holes in the iron face of the last. Now, to unite the two soles to the upper-leathers, holes are pierced all round the edges of the sole, and small nails are driven in, which are of sufficient length to penetrate through the sole and the turning-in of the upper-leathers, and also through the inner sole, so as to reach the metal face of the last, and being forcibly driven, their points will be turned by the iron, so as to clench within-side, or rivet through the leather, and serve instead of the sewing or stitching commonly employed to unite the sole to the upper-leathers.

SHOES.

SHOES, Machines for making. These are the invention of Mr. Brunel, of whose mechanical genius we have had frequent occasion to speak in this work. He has lately established at Battersea an extensive manufactory of shoes, chiefly intended to supply the army, where all the operations are performed by the aid of machines, which act with such facility, that they can be managed by the invalid soldiers of Chelsea Hospital, who are the only workmen employed, and most of them disabled by wounds, or the loss of their legs, from any other employment.

The shoes made by these machines are different from the common shoes, in the circumstance of the sole being united to the upper-leathers by a number of small rivets instead of sewing, in the same manner as those we have mentioned in the preceding article. To facilitate the description we intend to give of the machines, we shall first describe the structure of one of these shoes. Its upper-leathers are the same as any other shoes, and consist of three pieces; *viz.* the vamp, or part which covers the upper part of the foot, and the two quarters which surround the heel, and are sewed together behind it; they are also sewed to the vamp at about the middle of the length of the shoe. The sole part of the shoe is composed of the real or lower sole, with its welt, the heel, and the inner or upper sole.

The lower sole has an additional border, which is called the runner, or welt, fixed upon its upper side, all round the edge, by a row of rivets, so that it makes a double thickness to the sole towards the edge; but this additional piece is only of small width from the outside of the sole inwards, and gradually diminishes away in thickness to nothing, as it recedes from the edge of the sole, so that the middle part of the sole is only of the same thickness as the single leather. The upper-leathers are made sufficiently large to turn in, all round, beneath the foot, under the edge of the inner sole, for about three-quarters of an inch wide, and the outer sole, reinforced by the welt, is applied beneath, so that the turning-in is included between the two soles; that is, it is included between the edge of the inner sole and the welt, or extra thickness which surrounds the lower sole. To hold the shoe together, a row of rivets is put through the sole, all round the edge, and they are of sufficient length to pass through all the four thicknesses, *viz.* the lower sole, the welt, the upper-leathers, (where they are turned in,) and also through the inner sole; and these rivets being made fast, unite the parts of the shoe together in a much firmer manner than sewing. The rivets have no heads, but are made tapering, and the largest ends are on the outside of the sole, which prevents them from drawing through; and at the same time, the strength of the rivetting will not be materially impaired by the gradual wearing away of the sole leather.

These rivets prevent the wear in a very great degree, and for this reason there is a greater number of rivets put into the sole than merely those which hold the shoe together. The different nails are, first, the *short nails*, or rivets, which only penetrate through the single thickness of the lower sole; these are arranged in parallel rows across the tread of the foot, that is, about two-thirds of the length from the heel; there is likewise a double row of short nails, which is carried round parallel to the outline of the toe, at about three-quarters of an inch from the edge, and extends as far as the middle of the foot. Next, the *tacking nails*, which are of a sufficient length to reach through both the sole and the welt, and thus fix the two together: of these, there is a row all round the edge of the foot, nearer to the edge than the row of short nails before mentioned. Lastly, the *long nails*, which, as before described, fasten the shoe together: these form also a complete row round the edge of the

whole shoe, and nearer to the edge than any of the preceding rows. The heel is also fastened on by a row of long nails round its circumference. The heads or thick ends of all these nails appear on the lower surface of the sole, and all contribute to preserve the leather from wearing. We shall now proceed to a description of the ingenious instruments and machines used in this manufactory, beginning with those for

Cutting out the Leather.—This is performed by stamps, each of which is an iron frame or ring, bent to the size and figure of the sole, or other part to be cut out by it: one edge of the frame is edged with steel, and ground sharp, so that it will cut the leather: the sharp edge of this frame being placed upon the skin, and struck with a mallet, will cut out a piece from the skin, which is exactly of the same size as the interior opening of the frame. The leather for the soles is first softened, by soaking it in water; the skin is then spread out on a block or table of lead about two feet long and eighteen inches wide, and the stamp or knife for the soles is placed upon the skin in the most advantageous position to cut out the piece; then two or three blows upon the top of the knife with a beetle or large wooden mallet, forces its edge through the leather, and cuts out the piece, which remains in the opening of the knife, but being taken out another is cut in a similar manner.

A knife of this kind is provided for all the pieces which are used to form the shoe, and they are called after the names of the respective pieces, which are as follow: 1. The sole, which is not cut out the full size for the sole of the shoe, but wants a piece at the heel. 2. The sole-piece is a semi-circle, to be joined to the sole to make up the heel. 3. The heel: these two last pieces are cut out of the small pieces, or scraps of leather. 4. The runner, or welt, which is applied upon the sole, all round the edge, to make the extra thickness where the upper-leather is to be joined to the sole. All these parts are cut out from the strong hides. 5. The inner sole. The upper-leathers are, 6, the vamp, or part which covers the toes and upper part of the foot; 7 and 8, the right and left quarters, which surround the heel, and are sewed to the vamp, being also sewed together behind the heel.

All these parts, except the welts, are cut out by knives of the above description, there being a set of knives for every different-sized shoe which is made in the manufactory. For cutting out the inner soles, the knife is fixed horizontally, with its edge upwards, beneath a heavy cast-iron lever, which moves on a centre pin, supported in the same framing which sustains the knife. The lever has a plate of lead attached to it near the centre, so that when it is brought down horizontally the lead will descend upon the knife, the edge of which being imprinted into the lead, will cut through the leather which is previously spread upon the knife. To use this cutting-out machine, the sole is first cut out roughly from the skin by a common cutting-knife round a wooden pattern, and the lever being lifted up nearly to a vertical position, the rough sole is laid fairly upon the edge of the knife; then, by letting fall the lever, its weight, and the leverage upon the plate of lead, causes a sufficient pressure upon the leather to force it upon the edge of the knife, and cut it to the exact shape required. The lever is guided in its descent, to ensure that its lead shall fall precisely upon the knife.

Immediately after the soles are cut out, they are stamped on the grain-side of the leather with a number which denotes the size of the shoe to which they belong. The stamp is engraved on the face of a small hammer, so that one blow makes the desired mark. The heels and other parts are also marked,

marked, that the workman may make no mistakes in putting the shoes together.

The leather for the welts is cut into strips of about an inch wide: for this purpose, the piece is spread on a flat table about two feet square, the surface of which is covered with small iron rulers the width of the intended strips, and screwed down upon the wooden table, leaving between them sufficient spaces to admit the point of a knife. Several small pins project up from these iron rulers to penetrate the leather and hold it fast. To confine the leather down whilst it is cut, a frame of iron is fixed to the table by hinges at one end, so as to fold down horizontally upon the leather, and the frame is covered all over with similar rulers, the intervals between them corresponding exactly with those between the rulers on the table. The cutting is performed by a hooked knife, fixed into a long handle. The workman holds down the frame upon the leather, and introducing the hooked point of the knife between the bars, draws it towards him; this cuts through the leather, and he repeats it at every interval between the rulers, and thus divides the whole leather into slips of the same breadth as the rulers.

To prepare these slips for use, each one is split lengthways into two other slips, by an oblique cut along the middle of it; thus producing two slips, which have bevelled or feathered edges, similar to a ruler for drawing. The splitting of the strips is performed by a very complete machine, consisting of a pair of brass rollers, one of which is turned by a winch, and the other receives its motion from it by means of a pair of equal cog-wheels, one wheel being fixed upon the ends of each of the rollers. The rollers are mounted one above the other in an iron frame, in a similar manner to those used for laminating: the lower one has a groove formed round it, which is of a proper size to receive the strip of leather before it is divided, and the pressure of the upper roller compresses it into the groove. A guide, consisting of an iron stem, with a square hole through it, is fixed up before or in front of the rollers, to conduct the leather into the groove; and on the opposite side, or behind the rollers, is a stem, or standard, which receives a cylindrical steel pin, and holds it fast in an horizontal position, in the direction in which the strip of leather will move when it comes through the rollers. The end of this steel pin is flattened and ground to a fine sharp edge, like that of a chisel, and presenting itself to the end of the strip of leather as it is passed through the rollers, will evidently divide the strip longitudinally into two pieces, when the leather is forced forwards against the edge of the cutter by the motion of the rollers. This edge is placed obliquely to the axis of the rollers (or to the surface of the leather which passes between them), and therefore will divide it by an oblique cut, so as to produce two narrow feather-edged pieces from each strip. The pressure of the rollers upon the leather tends to consolidate its texture, and supply the place of hammering.

Preparation of the Soles.—The leather is hardened by passing it between rollers, to produce the same effect as hammering does in the ordinary method of shoe-making. The rollers used for this purpose are made of brass, about five inches diameter, and as much in length; they are mounted in the usual kind of frame, except that instead of screws to hold down the upper roller, and regulate its distance from the lower one, two plain cylindric pins are inserted into the holes which usually receive the screws, and these pins have a strong lever bearing upon their upper ends, to press the upper roller down upon the lower, by the action of a weight at the extremity of the lever. These pins are only about four inches distant from the centre or fulcrum of the lever, and the weight (of about 100 pounds) is at a distance

of four feet from the centre, it therefore presses down the upper roller upon the lower, with a force of nearly 1200 pounds. The lower roller has a cog-wheel upon the extremity of its spindle, which is moved by a pinion upon the end of an axis turned by a winch; one man turns this winch and another puts the soles between the rollers. Two soles are presented together, being laid one upon the other, with the flesh sides of the leather towards each other, and an iron plate is placed between them, which is made thick in the middle, and diminishes every way to the edges, where it is thin. The grain or hair side of the leather of the two soles is outside, so as to be in contact with the rollers when the soles are presented to the machine which draws them in; and when they have nearly passed through, the man who turns the winch reverses the motion, and rolls them back again, then forwards, and so on for four or five times, in the same manner as the motion for mangling linen. After this operation the leather becomes hard and solid, and much reduced in thickness, particularly at the middle part.

The heels being so small cannot conveniently be rolled; but to produce the same effect they are stamped in a fly-press: for this purpose, a heel-piece is put into a small box or cell of cast-iron, of a proper shape to receive it, and a thick plate, which is fitted to the box, being laid upon it, the whole is put beneath the screw of the press, one blow of which is sufficient to press the iron plate upon the leather, with a force which will render it hard and solid.

The sole is made complete by joining to it the small semicircular piece at the heel; for this purpose, the parts which are to be joined together are cut bevelled, so that they will overlap without increasing the thickness, and then three or four nails are driven through the bevelled parts, to hold them together. To cut the joints bevelled, a simple press is used; the sole is laid flat upon the edge of the bench, and a piece of iron is pressed down upon it by a lever, upon which the workman leans his elbow. The edge of the bench is bevelled, and faced with iron, and this, together with the upper piece of iron, guides the knife, so that it will cut the joint bevelled: the heel-piece is then cut in the same manner, but reversed.

Application of the short Nails.—The leather for the sole is next inlaid with short copper or iron nails, which are put through holes in the leather, in the broad part of the foot, where the greatest wear will take place; and there is also a double row of similar rivets, inlaid round the toe part, at about three-quarters of an inch within the edge of the sole. The holes for these nails are first punched in the leather of the sole by a punching machine, and then a second machine cuts the nails, and inserts them into the holes.

The *punching machine* is moved by the foot of the workman, who is seated before a small semicircular table of cast iron, on which he places the leather. This table is supported by a strong column, rising from the floor to a height of about two feet above the table, which is joined to the column by a projecting bracket, so that the column is on the opposite side to that where the workman is seated. The upper part of the column has two arms, projecting forwards from it towards the workman, and extending over the table; at their extremities they are formed into sockets, to sustain a square iron rod or perpendicular slider, which at the lower end has the piercer or awl screwed into it: one of the sockets guides the upper part of the slider, and the other the lower part, so that it has a freedom of motion in a perpendicular direction, but no other. The slider is caused to descend by means of a treadle moving on a centre pin, attached to the foot of the iron column, beneath the bench; from this treadle an iron rod ascends through a hole in the

SHOES.

bench (and also through holes in the arms, which project from the column to sustain the slider), and at the upper end this rod is connected with a lever, which moves on a joint at the upper end of the iron column, whilst the extreme end of the lever is connected with the top of the perpendicular slider. By this arrangement it is clear, that the foot, being pressed upon the treadle, will communicate motion by the iron rod and upper lever to the slider and piercer, and force its point through the leather, which is placed upon the small iron table. A short lever and counterpoise are provided to raise up the slider again the instant the pressure is removed. To prevent the piercer striking upon the iron of the table, and breaking the point, a screw is inserted in a piece projecting from the slider, and its point in descending comes to rest upon the upper of the two arms which sustain the slider, and thus stops the descent of the slider at the proper place.

The piece of leather for the sole is fixed upon a pattern made of iron plate, cut to the same size and shape as the sole, which is united to it by two sharp gauge pins, which are fixed in the pattern, one at the middle of the tread, and the other in the centre of the heel; and these pins project so far, that they will just penetrate through the leather, to hold it fast against the pattern, which is perforated with all the holes which are intended to be pierced in the sole. The leather is applied upon the pattern, and struck with a mallet, so as to force the gauge pins into the leather, and unite the sole and the pattern together; the pattern is then laid flat upon the table of the machine, with the leather uppermost, and is brought beneath the joint of the piercer, so that it will penetrate in the desired place. To ascertain this place, a small stud or pin is inserted into a hole in the table, in the exact spot where the point of the piercer descends; the stud projects a little above the surface of the table, but is only held up by a spring, so that it can easily be pressed down. The pattern being placed so that any of the holes therein receive the point of the stud, it is evident that when the pressure of the foot makes the piercer descend, its point will make a puncture in the leather which is fastened upon the pattern, which puncture will be opposite to the hole in the pattern; and though it perforates the leather quite through the thickness, the point of the piercer cannot be blunted against the iron, because it is received in the hole in the pattern, and the stud descends by the pressure, so that the pattern will lie quite flat upon the surface of the table. In this manner the workman pierces any number of holes in the leather, placing it beneath the point of the piercer by the aid of the pattern, and then pressing the foot to bring the point down and pierce the hole. As soon as the piercer rises, he removes the pattern to another hole, and so on. A small piece of iron is fixed just above the leather, which prevents its being lifted up, and following the piercer when it rises. The piercer passes through a hole in this piece.

Nailing Machine for the Short Nails.—The sole being thus pierced with holes, the short nails are put into it by a very curious machine, which at the same time forms the nails, by cutting them off from the end of a strip of iron or copper, of the same breadth as the length of the intended nails.

The sole is presented to the machine by laying it upon a small table, similar to the last machine, and is directed by means of the same pattern; so that each of the holes in the leather will be successively brought beneath the point of a blunt piercer, which descends by the action of a treadle. In the upper part of the machine is a pair of shears, to cut the nails: they consist of a lever, loaded at the extremity with a weight, and connected with the treadle, so that the end of the lever is lifted up when the treadle is depressed by

the foot. Near the centre of this lever is a cutter, which is fixed to it, and moves with it. Another cutter is supported by the frame, so as to be stationary, and in the proper situation to come in contact with the edge of the moving cutter, when the end of the lever is lifted up. The cutters act in a manner similar to a pair of shears, to cut off a small piece from across the end of a slip of iron, which is introduced between the cutters. This piece forms the nail or rivet, which is to be put into the hole in the leather; and immediately after it is cut, it falls into a tube, by which it is conducted down to a small cell or tube, situated immediately over the leather. In this the nail stands perpendicular, and ready, when the piercer descends, to be forced down into the hole in the leather; because the cell which receives the nail is exactly beneath the point of the piercer, so as to hold it perpendicularly in the proper situation. The workman is seated before the machine, and with his right hand directs the sole, with its pattern beneath the piercer, in the same manner as before described. In his left hand he holds the strip of iron or copper which is to make the nails; and he introduces the end of it through a small hole, which conducts to the cutters, pushing it forward with a gentle force: this causes the end of the strip to enter between the cutters, when the shears are open. Then adjusting the sole by the pattern, so that one of the holes in the leather will be beneath the nail contained in the cell, he presses down the treadle: this forces the nail down from the cell into the leather, by the descent of the piercer, and at the same time closes the shears, and cuts off a nail across the end of the strip. The nail immediately descends by the tube into the cell, where it places itself perpendicularly, and ready to be put in its place in its turn. Thus the machine, at every stroke, cuts a fresh nail to supply the place of that which it puts in the leather by the same stroke. The strip of copper is turned over every time, to form the nails alternately head and point.

When all the nails are put in, they are battered down with a hammer; and as they are but very little longer than the thickness of the sole, this reduces them to an even surface.

Application of the Welt to the Sole.—The welt, or runner, is a narrow slip of leather applied upon the sole, round its edge, to make the sole of a double thickness round the edge, where the upper leather joins to the sole, although the sole is only single within. The welt is made from the feather-edged slips which we have before mentioned, and is fastened to the sole by tacking nails of sufficient length to pass through both the sole and the welt. These nails are arranged all round the circumference of the sole, and the holes are first pierced through the sole by the punching machine, which we have before described, but by a different pattern of iron, which is attached to the sole by its two gauge pins entering the same holes which were made through the leather in the first operation. This pattern is pierced with a row of holes all round the circumference, which are arranged within the former row of rivets, or farther from the edge of the sole; but around the toe and tread of the foot, for half its length, the holes are in double number, or at half the distance that they are in the heel part. This pattern being used in the same manner as before described, the punching machine pierces the sole with holes, exactly corresponding to it; which holes are filled with tacking nails in a separate machine, something similar to the nailing machine before described. But as the nails are longer, it would be too laborious to cut them by the same motion; the nails are, therefore, cut by a machine made on purpose, and applied to the leather by

SHOES.

The nailing Machine for long Nails.—This is made exactly the same as the punching machine before described, but with additional apparatus to supply the nails, and put them into the holes. Thus it has a vertical column, with a table and two projecting arms to support the perpendicular slider, which is caused to descend when the foot is applied upon the treadle, and to re-ascend by the action of the counter-weight. The piercer at the lower end is not sharp-pointed, not being intended to penetrate the leather, but only to force the nails into the holes previously pierced by the preceding operation. The additional parts are as follow: a circular plate, or wheel of brass, about nine inches diameter, and of a thickness nearly equal to the length of the nails; it is perforated with a great number of holes, to contain the same number of nails; the holes being made round its circumference, as close together as convenient, and arranged in four circles, one within the other. The interior space within the circles is formed with six arms, like a wheel; and in the centre is a hole, which fits loosely upon an upright centre pin, standing in the centre of a small circular table, which is fixed sideways to the upper of the two arms, which, as before mentioned, project from the vertical column of the machine, and sustain the upper end of the perpendicular slider. Upon this circular table the wheel is supported in a horizontal position, at the height of 18 or 20 inches above the table on which the leather is placed, and with liberty to turn upon its centre pin. The wheel is filled with nails when it is used, one being put into every hole of its circumference, with the points downwards; and the holes are sufficiently large to let the nails drop through the wheel, except when their points rest upon the circular table which supports the wheel. At one part of the circumference of this table an opening is cut through it, and a small tube descends from it, to conduct a nail down to the point of the piercer. The motion of the wheel upon its centre brings the nails successively over the opening or mouth of the tube; and therefore each nail, in its turn, drops by its weight through the hole in the wheel into the tube, which is made so small, that the nail must descend with its point downwards, and fall into a small cell, so situated that the nail will stand exactly beneath the point of the piercer, when the same is at its highest position. But when the piercer is depressed by the action of the treadle, its point will act upon the head of the nail, and force it down through the cell into the leather placed upon the table of the machine; the hole in the leather having been previously pierced by the punching machine. The cell which receives the nail is very ingeniously contrived to hold it in a perpendicular direction, beneath the end of the piercer. It is situated immediately above the leather, and is conical within, so that the nail drops down into it until it becomes fixed fast; but when the nail is to be forced down by the piercer, the cell opens in two halves, being formed by notches in two pieces of steel, which are only held together by being screwed together at one end, and are made so thin as to spring together, and form a cell for the reception of the nail, although they will readily separate when the piercer forces down the nail. It is during the ascent of the piercer that another nail is dropped down from the wheel through the tube, and received into the cell, whilst its two halves are still kept open by the piercer; or rather as the piercer at this moment occupies the interior of the cell, the nail is received in the space, or open joint, at which the two halves of the cell separate, so that the nail lies close by the side of the piercer. But when the piercer has risen up completely out of the cell, its two halves spring together, and the joint in which the nail is placed being formed with faces inclining

inwards, they throw the nail into the cell itself, in which it drops down till it sticks fast; because, as before stated, the cell is smaller at the bottom; and in this situation the nail is certain to be held perpendicular, with its head under the point of the piercer.

To turn the wheel round, so as to supply a fresh nail every time that one has been put into the leather, the edge of the wheel is cut into serrated or sloping teeth; the number of teeth being equal to the number of holes made in each of the four circles to contain the nails. A small detent or click takes into these teeth by a hook, so that it will turn the wheel when moved in one direction, but slide over the teeth when moved in the other direction. The click is jointed to a short lever, fixed upon the upper end of an upright axis, which passes down through the two projecting arms of the main column, so as to be very near the perpendicular slider; and a short lever, fixed to this axis, bears, by the action of a spring, against a wedge fixed to the slider. The action of this mechanism is to turn the wheel round one tooth at a time: thus, when the slider descends, its wedge forces the end of the short lever farther away from it; this movement is communicated by the upright axis and upper lever to the click, which slides over the sloping sides of the teeth of the wheel; but on the re-ascent of the slider, the wedge allows the lever and click to return by the action of a spring, and the hook of the click, having caught a tooth of the wheel, will turn the wheel round the space of one tooth. In this manner, at every descent of the slider the click engages a fresh tooth of the wheel; and at every ascent, the wheel is turned round upon its centre pin; the weight of the wheel, resting upon the flat circular table, being sufficient to retain it as it is placed.

The nailing machine acts with the same rapidity as the other machines, to put a nail into every one of the holes previously made; and for this purpose the leather is kept upon the same pattern by which those holes were pierced, not only for the purpose of placing the leather so that the nails shall be inserted into those holes, but that the thickness of the pattern may allow the nails to penetrate and project through the leather on the under side. When the nails are all put in, they are beat down with a hammer, to drive all the heads to a level with the surface. The leather is then separated from the pattern, and put into a frame called

The welting Stand.—This machine is a small square table of cast-iron, fixed on the top of a pedestal, in which it is capable of turning round, for the convenience of the workman, and to enable him to work at the different sides, as he remains seated before the table. An iron frame is connected with the table by hinges at one side, so that it can be lifted up or turned down, to lie flat upon the surface of the table; and in this situation it can be fastened down by means of a simple clamp. This frame is intended to hold fast the leather which is placed beneath the frame: the interior opening of the iron frame is nearly of the same size and shape as the sole of the shoe. The sole is placed flat upon the table, in the proper position, which is determined by two gauge pins fixed into the table, and entering the holes made in the sole; then the iron frame being turned down upon the leather, will inclose the sole as it were with an iron hoop, or raised border, all round the edge; and the frame being clamped fast down, the sole is confined, as if lying in the bottom of a cell of iron, of the same figure as itself, and with the nail points projecting upwards from the sole. In this frame the welt is applied, by laying the strip of leather upon the edge of the sole in contact with the inside of the iron frame, and bending it to follow the curves of the outline of the sole. As fast as any part of the length of the

SHOES.

strip is settled to its position, it is attached to the sole by striking it down with a mallet upon the points of the nails. The thin or feathered edge of the strip of leather is put inside, so that the edge of the sole, for about the breadth of half an inch, is of a double thickness; but within this, the extra thickness diminishes away to nothing, leaving only the thickness of the sole. The ends of the strip of leather which compose the welt, where they join and complete the circuit of the sole, are cut sloping, so as to lap over each other, and make a joint, without any increase of thickness, or apparent division. When the sole is taken out of this frame, the welt and sole are beat well down together, to make a good joint; it is then carried to the cutting press, in which the edge or outline of the sole and welt are cut smooth, and to the same size; because, as the frame of the welting machine must be rather less than the sole, in order that the frame may bear upon the edges of the sole all round, and thus hold it fast, the welt, which is moulded or bent round within the frame, will be a small quantity less all round than the sole. To guide the knife in cutting round the edge of the sole, it is confined between two iron patterns, which are made exactly to the size to which the edge is to be pared. They are attached to the sole by two gauge pins, fixed into one of the plates, and passing through the holes in the sole, project far enough on the opposite side for the other plate to be fastened on, in its required position, by two holes which receive the ends of the pins.

The *cutting-press* very much resembles a common lathe: a horizontal spindle is supported in a frame, consisting of two standards, erected from a horizontal plate, to sustain the spindle, which passes through a collar in one of these standards, and projects some inches beyond it, having at the extremity a piece of wood flat on the surface, and of the same shape as the sole. Against this flat surface the two iron plates, with the sole between, are placed, and they are forcibly pressed together by the action of a screw, fitted into a third iron standard, erected from the same horizontal plate, and pressing by means of a lever upon the iron plates exactly opposite the end of the spindle. This pressure causes the spindle to retreat a small quantity in the direction of its length, and then a flat circular plate, fixed upon the spindle, (in the same situation as the pulley of a common lathe,) is made to press against a similar flat plate, which is fastened to the frame, and therefore cannot turn round. By the friction between these two surfaces, the spindle becomes immovable, and the press holds the sole firm, whilst the workman, who is seated before the machine, cuts all round the edge with a drawing-knife, which is made sharp in the middle, and is worked with both hands by having a handle at each end. When he has with this tool pared down that part of the edge which is uppermost, he releases the screw of the press, and a spring then causes the spindle to advance so far as to relieve the flat circular plate, which is fixed upon the spindle, from its contact with the fixed plate. This leaves the spindle at liberty to be turned round, and the sole turns with it, so as to bring up a new part of the edge of the leather to a convenient situation to be pared or cut; and the screw is then turned to fasten the spindle as before described, and at the same time to press the sole between the two patterns.

When the edge of the sole is thus cut, it is carried to a grindstone, and ground smooth: the stone is turned with a quick motion, by means of a band and large wheel; the leather is afterwards polished by applying it to the edge of a wooden wheel, on which a little bees-wax is spread.

Application of the long Nails.—The sole, thus re-inforced by the welt, is returned to the punching machine, and be-

ing attached to another pattern, a range of holes is pierced all round the outer edge, through both, just within the former row of tacking nails; after which, by the nailing machine, these holes are filled with nails which project through the upper side of the welt, being longer than any of the former, and being also intended to penetrate through the upper-leather and inner soles, and thus fasten the shoe together. In this state the sole is ready to be put to the upper-leathers.

The *upper-leathers* are prepared for applying to the sole, in the same manner as the ordinary shoe, viz. by sewing the vamp, or piece which covers the upper part of the foot, to the two quarters which go round the heel, and also sewing these two quarters together behind the heel. The workmen do not hold the work upon their knees to sew it, but four men work at a square table, the corners of which are cut off, and a small piece of wood projects from each angle: the two pieces of leather which are to be sewed together are laid upon one of these pieces of wood in the proper position to be sewed, and are held fast by an endless strap, which is laid over them, and the workman binds it fast down, by pressing his foot in the strap, like a stirrup. This method of sewing, which is far superior to the common mode, might, from its simplicity, be used by all shoe-makers, and would render their business less unhealthy; whereas at present they are subject to many diseases from sitting in the awkward and unnatural posture which is necessary to reach their work, when they hold it upon their knees.

Operation of closing or rivetting the Shoe together.—The upper-leathers are put upon a last, and held tight thereupon whilst the sole is applied. This is done in

The Clamping Machine.—It is a small oval table, supported on a column, but capable of turning round upon the column, to enable the workman to work at any side. In the centre of the table a last is fixed, with the sole upwards; it is supported at a height of about six inches from the table. The sole is made of cast-iron, in a solid piece, with the stem or part by which the last is supported; but the under part, upon which the upper-leathers are to be moulded, is made of wood, for the convenience of altering the figure when necessary. The last is fixed upon the table by means of two steady pins; and a strong pin, which projects from the lower part of the last, and passes through the table, is bound fast by a wedge, which confines the last firmly upon the table, in the same manner as if it was made in a piece therewith. The table has a number of pieces of brass attached to it by hinges, and arranged all round the last in such a manner, that they can be turned up against the lower part of the last, and then form clamps, which are exactly adapted to the figure of the lower part of the last, and will therefore clamp or bind the leather firm upon the last at the toe, heel, and every part thereof, except at the flat part of the sole. The brass clamps are of such dimensions, that they will touch each other when turned up, and thus form a complete cell or box, in which the lower part of the last will be contained, and the leather confined upon it; but the cell being made in several pieces, or clamps, they can be removed one by one, as found necessary. The clamps are forced up to their situation by means of an independent screw for each, which is tapped in an oblique direction through the edge of the table, and the point forces up the end of a small rod, which is jointed to the clamp near the part where it acts upon the leather: by this means the force of the screw acts to turn the clamp up upon its hinge, and at the same time presses it against the leather. When the pressure is released by displacing the end of the small rod from the point of the screw, the clamp will be suffered to fall back upon the table; and this being done

SHOES.

done to all the clamps, the last stands insulated in the middle of the table, from which it can be detached by withdrawing the wedge which confines it. The inner sole of the shoe is first put upon the sole of the last, being slightly fastened thereto by two short pins, one of which is driven through the gauge hole in the toe of the sole, and enters a hole made in the last; and the other pin is fixed in the heel part of the last, and enters the hole in the sole. The upper-leathers are now put upon the last in the true position. In this state, the last is taken to the clamping machine, and fastened into its place in the centre of the table; the clamps are then turned up, one by one, beginning at the heel, and the upper-leathers being pulled up all round by a pair of pincers, so as to make them fit tight upon the last, the clamps are screwed tight. In this state, the upper-leathers are made to take the form of the last, being firmly attached thereto, except at the sole part: at this part the leather stands up all round about three-quarters of an inch, which quantity is turned down flat upon the edge of the inner sole (previously fastened upon the sole of the last), and a small quantity of paste is put in to make it stick fast: four or five notches are cut out in the leather at the toe and at the heel, to make the part which is turned down lie flat upon the sole, without folds or overlapping, and then, to make a close contact, the leather is beaten down. Parings of leather are likewise pasted, and stuck flat upon the inner sole for levelling, to make up the sole to the same thickness in the centre as it acquires towards the edges all round by the turning-in of the upper-leathers. In this state, the nail which fastened the inner sole to the last is withdrawn, being now unnecessary, and the real sole is applied, an iron frame, or saddle, being employed to determine its proper position upon the last. This frame is made of thin iron, and its figure within is similar, and of the same size as the row of nails which project through the sole, and by which the sole is to be rivetted into its place: it is made in two halves, which are united by a joint or hinge at the heel part; and at the toe part are two holes, through which a pin can be put to hold the frame together. This pin, as well as the joint pin of the hinge at the heel, projects downwards sufficiently to enter into a hole made in each of the two clamps at the toe and heel, in such a position as to guide the frame, so that it will apply the sole exactly in the proper position.

The sole, when prepared as before described, by inserting all the long nails in the holes, so that their points project through the leather, is put into an iron box or mould, and a plate being laid upon it, is put into the fly-press, and by a single blow the sole is rendered concave within, so as to adapt itself to the last. When it is taken out of the mould, the iron frame before-mentioned is put together round the row of nails, the size of the inside of the frame being made exactly of the proper size to receive the projecting points of the nails, and retain them perpendicular to the leather, and prevent them from spreading out. The sole is then applied in its place by the two guide pins of the frame, and by striking upon the heads of the nails, their points penetrate through the turning-in of the upper-leather, and also through the inner sole. When they are well entered the iron frame is taken away, by withdrawing its pins, and opening its two halves on their joint, and the nails are driven down into their places. This causes them to project through the inner sole into the shoe, and the points meeting the iron last are turned back, and thus clenched into their places. To render this more certain, the sole of the last is made with a slight groove all round, where the points of the nails will fall, and the groove

being of a semicircular figure, the points are more readily turned thereby, and are all turned the same way, so that they will not interfere.

The shoe is now put together, and the clamps being relieved and turned down, the shoe is taken off the last; for which purpose the heel of the last is made in a separate piece, and jointed to the other by inclined fittings, and with a tongue or rebate, so that it can be held fast in its place by a single hook or spring catch; but this being relieved, the shoe draws off the last with the greatest ease, the heel part remaining within the shoe, and is taken out afterwards. The shoe is now carried to the *rivetting last*, where it is put upon a last exactly similar to that of the clamping machine, but fastened down upon a bench, and the sole is smooth without the groove, which caused the points of the nails to turn up. Upon this last the nails are beaten down, to rivet all fast, and make the sole smooth within: the heel is then put on by laying it in its place, and driving down the long nails which have been put through it by the nailing machine, in the same manner as for the sole.

The sole of the shoe is now rasped with a coarse file, to level all the nail-heads, and render the leather smooth; the shoes are then carried to the grindstone, by which they are polished, and finished up in every part, the soles blacked, and polished by the wheel with a composition of bees-wax and ivory black, which renders them glossy: the upper-leathers are then brushed by a circular brush, which is turned by the lathe, and the shoes are rendered fit for sale, except those which require binding and lining, with a lining of thin leather, in which case they are finished in the same manner as common shoes.

Nail Machine.—This is equally deserving of notice with any other part of this ingenious manufactory. In our article NAIL we have described some nail machines; but we consider this as a much better machine for cutting brads or nails without heads. The nails are cut from sheet-iron, the plates being first reduced into slips, of a breadth equal to the length of the intended nails, by a large pair of shears, acting in the same manner as those described in the article CANTEEN, but are constructed in a superior manner, by employing cast-iron for the framing and for the lever. The iron plate is presented to the machine by one man, whilst another works the handle, and at a single stroke cuts off the desired strip of iron: the sheet of iron is cut so that the direction of the grain, or fibrous texture which the iron acquires by rolling, will be across the length of the strip. From this it follows, that when the nails are formed by cutting off narrow pieces from the end of the strip, the grain of the iron will be the lengthwise of the nail.

The *cutting of the nails* is readily performed by the machine, which is turned by the foot of the workman, whilst he supplies the iron by his hands. The motion of the treadle turns a crank and heavy fly-wheel, similar to the wheel of a lathe: from the same crank a rod proceeds to the longer end of a stout lever, the axis of which is supported on pivots in the upper part of the frame, so as to be above the wheel and crank. At a small distance from the centre of the lever, and at the opposite side of the axis to the long lever, a steel cutter is fixed, which acts against a fixed cutter supported by the frame; the fixed cutter has an edge on the upper side, and the moving cutter, which is fixed to the lever, is made sharp on the lower side. The revolution of the wheel and crank causes the lever to rise and fall, and the edges of the two cutters in this motion pass as close together as possible, without touching. At the most elevated position of the moving cutter, its edge rises above the edge

of the fixed cutter so far, that the thickness of the strip of plate can be admitted between them; the end of the strip is pushed back, so that a small portion of the end of it overhangs the edge of the fixed cutter; therefore the edge of the fixed cutter, when it descends, meets this overhanging piece, and pressing it down upon the edge of the fixed cutter, cuts it off, and the piece so separated forms a nail. When the moving cutter re-ascends, the iron is pushed forwards again to overhang the fixed cutter, and another nail is thus cut off. The nails are narrow at one end to form the point, but at the other end are about as broad as the thickness of the plate, so as to be of a square figure; but at the point they are, in one direction, as broad as at the head; this is the direction of the thickness of the plate, so that in reality the nail is the figure of a small wedge instead of a pyramid, the point being in fact a sharp edge. To effect this, the cut which the machine makes across the end of the strip of iron is not perpendicular to the length of the strip, but rather inclined thereto; and at every successive nail which is cut, the inclination of the cut is reversed, so that the head of one nail is cut from the same side as the point of the next, and so on alternately of the whole length of the slip of iron. The thickness of the nail is regulated by the quantity which the end of the slip is allowed to project over the edge of the fixed cutter, and the angle of inclination by two stops, against which the edge of the slip is always brought to bear, when the workman places it ready for the cut. To stop the end of the iron, a part projects from the lever beneath the edge of the moving cutter, and is curved to the arc of a circle described from the axis: this stop is as far removed behind the edge of the cutter as the thickness of the nail intended to be cut off by the descent of the moving cutter. In working the machine, the workman keeps the wheel constantly revolving by the motion of the treadle; and holding the slip with its edge in contact with the two stops, so as to give it the proper inclination, he pushes it forwards, with a gradual pressure, against the moving cutter: then the instant the cutter is sufficiently raised to admit the slip, it will advance forwards, until the end of the slip touches the stop which is beneath the cutter: on the descent of the cutter, the nail is cut off, and the workman immediately turns the slip with the other side upwards, which has the effect of reversing the inclination of the cut; and pushing it forwards, another nail is cut as the former, and thus the operation continues with the utmost rapidity.

There are several suits of machines in this manufactory, so that a great number of shoes are proceeding at the same time through the different stages of their fabrication; and the rapidity of the execution is such, that a given number of workmen will here make a far greater number of shoes than by the common method, and they are more durable, particularly for the strong shoes which are desirable for soldiers. Several of the machines were constructed by Mr. Maudslay, with his usual accuracy of execution.

Shoe-makers' Machine.—This is a simple contrivance, to enable those artificers to perform their work in a standing posture; by which means they will avoid the diseases incident to those who follow sedentary employments.

In the common method of working, the shoe-maker is obliged to sit and stoop in the most awkward posture imaginable, sometimes in order to hold the shoe and last between his stomach and his thigh, whilst he sews the sole to the upper leather; at other times he must hold the last between his knees; and to sew the leathers together whilst he holds them upon his knees, he must lean very much forwards. In all these operations he sits as it were doubled up, so as to

impede the action of his lungs, and ultimately produce many diseases. The machine is a kind of vice, to hold the shoe in any position whilst it is sewed.

The Society of Arts have shewn a laudable desire to recommend these machines to the trade; and to induce their general adoption, they have given several rewards to those who have produced machines. The first of these was Mr. Holden, then Mr. Parker, and next Mr. Stafs, whose machine, being more improved than the preceding, demands some description. A small bench, or table, is firmly supported on four legs, at about four feet from the ground; a circular cushion is affixed upon the bench, having a hollow or basin in the centre of it, with a hole from the bottom of the hollow, quite through the cushion, and also through the centre of the bench. This hole receives a strap, which is doubled, and the two ends sewed together. The last is put into the double of the strap, and it is drawn down by a treadle, so as to hold the last firmly in the hollow of the cushion, which is stuffed soft withinside; and as the hole through the cushion is too small for the shoe to pass down, the last can be set in any direction which is most convenient for the sewing; but by relieving the treadle, it can be removed in an instant, turned round, and fixed again to sew another part. A seat can be applied in front of the machine, for the workman to rest himself occasionally: this seat is supported by only two legs, and a piece of wood, which projects horizontally from beneath the seat, and enters into a mortise, made in a part of the frame. Upon this the workman sits astride, as if upon a saddle; and as his work is held before him at a proper height, he sits in an upright posture, which is not attended with the same prejudicial effects as stooping to work upon the knee. The machine is provided with a small tray, or box, behind the cushion, to contain all the small articles which the work requires; also a drawer beneath it for tools, &c.; a whetstone fixed up at a convenient height; and an anvil, which fits into the hollow of the cushion, so as to lie firmly, to hammer the leather upon instead of a lapstone.

Shoe-makers are to make their shoes of sufficient leather, or forfeit 3s. 4d. (1 Jac. I. c. 22.) and journeymen shoe-makers embezzling leather shall make satisfaction for damage, or be ordered by justices to be whipped, &c. Persons buying or receiving such leather, are to make reasonable recompence, to be levied by distress, &c. and search is to be made after the same: also leaving their work undertaken, or neglecting it, to be sent to the house of correction for a month. 9 Geo. I. cap. 27. 13 Geo. II. c. 8. See LEATHER.

SHOE, in the *Manege*. A horse-shoe is a piece of flat iron, with two branches or wings, which being commonly forged according to the form of the hoof for which it is designed, is made round at the toe, and open at the heel.

A shoe for all feet, is one that is cut at the toe into two equal parts, which is joined by a rivetted nail, upon which they are moveable in such a manner, that the shoe is enlarged or contracted less or more at pleasure, in order to make it fit all sorts and sizes of feet.

To shoe a horse after the form of a lunette, a patin, &c. see LUNETTE, PATIN, &c. See also SHOEING of Horses, &c.

Berenger observes, that the ancients did not shoe their horses, that is to say, they did not nail upon their hoofs any pieces of iron, or of other metal, in the form of the modern horse-shoes: but when they intended to defend them from any thing that might annoy them in travelling, they fastened upon their feet, by means of straps and ligatures, a sort of sandal, stocking, or what we call boots. These

These were made of fedges twisted together like a mat, or else of leather, and were sometimes strengthened with plates of iron, and adorned by the rich and ostentatious with silver and gold, as in the instances of Nero and Poppæa.

It does not appear in what era, or in what country, the modern art of shoeing took its rise. The earliest proof which the above mentioned writer has met with is the shoe said to have belonged to the horse of Childeric, who lived in the year 481, and is preserved in Montfaucon's *Antiquities of France*. It perfectly resembles the shoe now in use. Berenger's *Horsemanship*, vol. i. p. 234.

SHOES of the Horse and other Animals, the crooked pieces of iron attached to the hoof of the horse or other beasts, by means of nails. There are various forms and shapes of shoes in common use, and others which are adapted and accommodated to the particular purposes and circumstances of the hoofs. Different sorts of animals, likewise, require different forms in their shoes. In speaking of the shoe which is *concave* on its *lower surface*, it has been remarked by some, that there are certain proportions to be observed in its different parts. Its breadth should be considerably less than the breadth of the common shoe; it is totally unnecessary to cover any part of the sole, especially when care is taken to preserve its natural hardness. The breadth of the shoe at the heels should be one-half of its breadth at the toe. Its thickness should decrease gradually from the toe, so as to be reduced one-half at the extremity of the heels. As to the distribution of the stamp-holes, every person acquainted with the subject knows, that in shoes for the fore-feet, they should be at the toe and quarters, because the wall, or crust, of the fore-feet is stronger at the toe than at the heels. The reverse of this is to be observed in the hind shoes, because the heels and quarters of the hind-feet are commonly stronger than the toe. It is impossible to lay down any general rule for disposing of these holes in bad feet; it must be the business of the farrier to distribute them in such a manner, as to be able to fix the nails in those parts of the crust where the horn is found and firm. Farriers generally multiply these stamp-holes too much, which brings the nails too close together, occasions the horn to break in splinters, and at length destroys the crust.

The following number is recommended for good feet; *viz.* for race-horses six, that is three on each side; for saddle-horses seven, four on the outside and three within, the quarter on this side being weaker than on the other; the same number for coach-horses of the middling size; for large coach-horses four on each side; and for cart-horses, five on the out and four on the inside. It is also of principal importance to determine the *weight of the shoe*, for it is matter of astonishment, to see some horses with shoes weighing each five pounds, making together a burden of twenty pounds of iron attached to their four feet. It is obvious to common sense, that such an additional weight, fixed to the extremity of the leg, must be productive of some inconvenience or other; and, in fact, the muscles are thereby compelled to greater exertion; the ligaments are stretched, and the articulations continually fatigued: and, besides all these evil consequences, the shoe by its weight forces out the nails, and so entirely spoils the texture of the wall or crust, that it becomes often extremely difficult to fix the shoe to the hoof. Why then, it is asked, do not practitioners of the present day, who are daily witnesses of these facts, and indeed are the principal authors of them, apply themselves to the correction of their own errors? The answer, it is feared, is obvious: because he who is uneducated and destitute of sound principles in his art, cannot

turn to real profit the experience he has acquired, nor abandon the path of prejudice and custom, in which he has so long journeyed, but satisfies himself with continuing to imitate and repeat whatever he has seen done by others.

The weights which are proposed, for shoes of different kinds, are nearly as follow:

	lb.	oz.
For the strongest sort of cart-horses	-	2 12
For the smaller horses of this kind	-	1 12
For the largest coach-horses	-	1 12
For the smaller ditto	-	1 4
For faddle-horses of any height	-	2 to 10
For race-horses	-	0 4 to 5

And by reducing the superfluous breadths of these shoes, their thickness may, it is supposed, be increased without making any addition to their weight. See *SHOEING*.

SHOES of Cattle, the small plates of iron that are fastened upon the feet of oxen, or other cattle employed in field or road labour. Shoes of this sort consist, according to some, of a flat piece of iron, with five or six stamp-holes on the outward edge, to receive the nails: at the toe is a projection of some inches, which passing in the cleft of the foot, is bent over the hoof so as to keep the shoe in its proper place. This projection is not, however, employed in the general practice of making these shoes, nor can it in common be of any utility. See *SHOEING of Oxen*.

SHOE of Gold, in Commerce, an ingot used as money in China. Gold is here considered as merchandize; it is sold in regular ingots of a determined weight, which the English call *shoes* of gold; the largest of these weigh 10 tales, and the gold is reckoned 94 touch (that is 94 parts fine in 100), though it is really only 92 or 93. Formerly, 10 tales of silver were given for one tale of gold of the same degree of fineness; but of late, from 100 to 110 tales of silver of 94 touch have been given for 10 tales of gold of 92 or 93 touch; and sometimes from 110 to 120 tales, or even more, of Spanish dollars, reckoned at 92 touch, have been paid for 10 tales of gold. It must be observed, that when gold is exchanged for silver, its price is always valued by the 10-tale weight; and it is sold either above or below touch, as follows: if the gold be 96 touch, and sold at 5 under touch, subtract 5 from 96, and 91 remains; then 91 tales of silver are paid for 10 of gold: if gold be sold at 10 above touch, the fineness being still 96, add 10 to 96; and 106 tales of silver are paid for 10 tales of gold.

We shall here observe that there is but one kind of money made in China, called *cash*, which is not coined but cast, and which is only used for small payments: it is composed of six parts of copper and four parts of lead; it is round, marked on one side, and rather raised at the edges, with a square hole in the middle. These pieces are commonly carried, like beads, on a string or wire. A tale of fine silver should be worth 1000 cash; but on account of their convenience for common use, their price is sometimes so much raised that only 750 cash are given for the tale. See *TALE*.

SHOE, Horse, in Fortification, Mining, &c. See *HORSE-SHOE*.

SHOE, Horse, Head. See *HORSE-SHOE Head*.

SHOE of the Anchor, in Sea Language, a small block of wood, convex on the back, and having a small hole sufficient to contain the point of the anchor-fluke on the fore side. It is used to prevent the anchor from tearing or wounding the planks on the ship's bow, when ascending or descending; for which purpose the shoe slides up and down along the bow, between the fluke of the anchor and the planks, as being pressed close to the latter by the weight of the former. Falconer.

SHOE,

SHOE, To, an Anchor. See *Shoeing the ANCHOR.*

SHOE-Blocks, are two single blocks, cut in a solid piece transversely to each other. They are used for legs and falls of the bunt-lines, but are seldom employed.

SHOE-Houfing. See *HOUSING.*

SHOEBURY NESS, in *Geography*, a cape of England, on the fourth coast of the county of Essex, at the mouth of the Thames. Here king Alfred erected a fortress against the Danes. There are two villages near North and South Shoebury, both containing together about 200 inhabitants; 5 miles N.E. from the Nore. N. lat. $51^{\circ} 32'$. E. long. $0^{\circ} 45'$.

SHOEING of HORSES, a term applied to the operation of fastening the pieces of iron on the bottom parts of the hoofs, or that of fixing shoes to the feet. These, and some other animals destined to labour, are shod with iron, in order to defend and preserve their hoofs. The shoes of horses should differ according to the feet, as has been already seen. The common form of shoes, and the method of shoeing, are wholly condemned by some, as Mr. Clark, and a new method recommended, which appears founded on just principles, and to have been sanctioned by much experience. It is remarked, that in preparing the foot for the shoe, according to the common method, the frog, the sole, and the bars or binders, are pared so much that the blood frequently appears. The common shoe by its form (being thick on the inside of the rim, and thin upon the outside), must of consequence be made concave or hollow on that side which is placed immediately next the foot, in order to prevent its resting upon the sole. The shoes are generally of an immoderate weight and length, and every means is used to prevent the frog from resting upon the ground, by making the shoe-heels thick, broad, and strong, or raising cramps or caukers on them. From this form of the shoe, and from this method of treating the hoof, the frog is raised to a considerable height above the ground, the heels are deprived of that substance which was provided by nature to keep the crust extended at a proper width, and the foot is fixed as it were in a vice. And by the pressure from the weight of the body, and resistance from the outer edges of the shoe, the heels are forced together, and retain that shape impressed upon them, which it is impossible ever afterwards to remove; hence a contraction of the heels, and of course lameness. But farther, the heels, as has been observed, being forced together, the crust presses upon the processes of the coffin and extremities of the nut-bone: the frog is confined, and raised so far from the ground, that it cannot have that support upon it which it ought to have: the circulation of the blood is impeded, and a wasting of the frog, and frequently of the whole foot, ensues. Hence, it is contended, proceed all those diseases of the feet known by the names of founder, hoof-bound, narrow-heels, thrushes, corns, high soles, &c.

And it has likewise been frequently observed, that there arises from this compression of the internal parts of the foot, a swelling of the legs immediately above the hoof, attended with great pain and inflammation, with a discharge of thin, ichorous, fetid matter: from which symptoms, it is often concluded that the horse is in a bad habit of body (or what is termed a grease falling down), and must therefore undergo a course of medicine, &c. The bad effects of this practice are still more obvious upon the external parts of the hoof. The crust towards the toe, being the only part of the hoof free from compression, enjoys a free circulation of that fluid necessary for its nourishment, and grows broader and longer; from which extraordinary length of toe, the horse stumbles in his going, and cuts his legs. The smaller particles of

land insinuate themselves between the shoe and the heels, which grind them away, and thereby produce lameness. All this is entirely owing to the great spring the heels of the horse must unavoidably have upon the heels of a shoe made in this form. This concave shoe in time wears thin at the toe, and, yielding to the pressure made upon it, is forced wider, and of consequence breaks off that part of the crust on the outside of the nails. Instances of this kind daily occur, inasmuch that there hardly remains crust sufficient to fix a shoe upon. And further, it is generally thought, that the broader a shoe is, and the more it covers the sole and frog, a horse will travel the better. But, as it has been remarked, the broader a shoe is of this form, it must be made the more concave; and, of consequence, the contracting power upon the heels must be the greater. It is likewise to be observed, that, by using strong broad-rimmed concave shoes in the summer season, when the weather is hot and the roads very dry and hard, if a horse is obliged to go fast, the shoes, by repeated strokes (or friction) against the ground, acquire a great degree of heat, which is communicated to the internal parts of the foot; and, together with the contraction upon the heels, occasioned by the form of the shoe, must certainly cause exquisite pain. This is frequently succeeded by a violent inflammation in the internal parts of the hoof, and is the cause of that disease in the feet so fatal to the very best of our horses, commonly termed a founder. This is also the reason why horses, after a journey or a hard ride, are observed to shift their feet so frequently, and to lie down much. And if we attend further to the convex surface of this shoe, and the convexity of the pavement upon which horses walk, it will then be evident that it is impossible for them to keep their feet from slipping in this form of shoe, especially upon declivities of the streets. It is also a common practice, especially in this place, (Edinburgh), to turn up the heels of the shoes, into what are called cramps or caukers, by which means the weight of the horse is confined to a very narrow surface, *viz.* the inner round edge of the shoe-rim and the points or caukers of each heel, which soon wear round and blunt; besides, they for the most part are made by far too thick and long. The consequence is, that it throws the horse forward upon the toes, and is apt to make him slip and stumble. To this cause we must likewise ascribe the frequent and sudden lameness horses are subject to in the legs, by twisting the ligaments of the joints, tendons, &c. It is not affirmed that caukers are always hurtful, and ought to be laid aside: on the contrary, it is granted that they, or some such-like contrivance, are extremely necessary, and may be used with advantage upon flat shoes where the ground is slippery; but they should be made thinner and sharper than those commonly used, so as to sink into the ground, otherwise they will rather be hurtful than of any advantage.

It is suggested that the Chinese are said to account a small foot an ornament in their women; and for that purpose, when young, their feet are confined in small shoes. This no doubt produces the desired effect; but must necessarily be very prejudicial to them in walking, and apt to render them entirely lame. This practice, however, very much resembles our manner of shoeing horses; for, if we looked upon it as an advantage to them to have long feet, with narrow low heels, and supposing we observed no inconvenience to attend it, or bad consequence to follow it, we could not possibly use a more effectual means to bring it about than by following the method already described. It is supposed that in shoeing a horse, therefore, we should in this, as in every other case, study to follow nature: and certainly that shoe which is made of such a form as to resemble as nearly as possible

possible the natural tread and shape of the foot, must be preferable to any other. But it is extremely difficult to lay down fixed rules with respect to the proper method to be observed in treating the hoofs of different horses: it is equally difficult to lay down any certain rule for determining the precise form to be given to their shoes. This will be obvious to every judicious practitioner, from the various constructions of their feet, from disease, and from other causes that may occur; so that a great deal must depend upon the discretion and judgment of the operator, in proportioning the shoe to the foot, by imitating the natural tread, to prevent the hoof from contracting a bad shape. In order, therefore, to give some general idea of what may be thought most necessary in this matter, it is endeavoured to describe that form of shoe, and method of treating the hoofs of horses, which, from experience, has been found most beneficial. And in this it is to be remembered, that a horse's shoe ought by no means to rest upon the sole, otherwise it will occasion lameness; therefore it must rest entirely upon the crust: and, in order that we may imitate the natural tread of the foot, the shoe must be made flat (if the height of the sole does not forbid it); it must be of an equal thickness all around the outside of the rim; and on that part of it which is to be placed immediately next the foot, a narrow rim or margin is to be formed, not exceeding the breadth of the crust upon which it is to rest, with the nail-holes placed exactly in the middle, and from this narrow rim the shoe is to be made gradually thinner towards its inner edge. And that the breadth of the shoe is to be regulated by the size of the foot, and the work to which the horse is accustomed; but in general, it should be made rather broad at the toe, and narrow towards the extremity of each heel, in order to let the frog rest with freedom upon the ground. The necessity of this has been already shewn. The shoe being thus formed and shaped like the foot, the surface of the crust is to be made smooth, and the shoe fixed on with eight or at most ten nails, the heads of which should be sunk into the holes, so as to be equal with the surface of the shoe. The sole, frog, and bars, as has been already observed, should never be pared, farther than taking off what is ragged from the frog, and any excrescences or inequalities from the sole. Mr. Osmer has remarked, that the shoe should be made so as to stand a little wider at the extremity of each heel, than the foot itself: otherwise, as the foot grows in length, the heel of the shoe in a short time gets within the heel of the horse; which pressure often breaks the crust, and produces a temporary lameness, perhaps a corn. But this method of shoeing horses has been followed long before Mr. Osmer's treatise on that subject was published; and for these several years past it has been endeavoured to introduce it into practice. But so much are farriers, grooms, &c. prejudiced in favour of the common method of shoeing and paring out the feet, that it is with difficulty they can even be prevailed upon to make a proper trial of it. They cannot be satisfied unless the frog be finely shaped, the sole pared, and the bars cut out, in order to make the heels appear wide. This practice gives them a show of wideness for the time; yet that, together with the concave form of the shoe, forwards the contraction of the heels, which, when confirmed, renders the animal lame for life.

It is contended, that in this flat form of shoe, its thickest part is upon the outside of the rim, where it is most exposed to be worn; and being made gradually thinner towards its inner edge, it is therefore much lighter than the common concave shoe; yet it will last equally as long, and with more advantage to the hoof; and as the frog or heel is allowed to rest

upon the ground, the foot enjoys the same points of support as in its natural state. It must therefore, it is supposed, be much easier for the horse in his way of going, and be a means of making him sure-footed. It is likewise evident, that, from this shoe, the hoof cannot acquire any bad form; when, at the same time, it receives every advantage that possibly could be expected from shoeing. In this respect it may very properly be said, that we make the shoe to the foot, and not the foot to the shoe; as is but too much the case in the concave shoes, where the foot very much resembles that of a cat's fixed into a walnut-shell. But it is to be observed, that the hoofs of young horses, before they are shod, for the most part are wide and open at the heels, and that the crust is sufficiently thick and strong to admit of the nail's being fixed very near the extremities of each. But, as has been formerly remarked, from the constant use of concave shoes, the crust of this part of the foot grows thinner and weaker, and when the nails are fixed too far back, especially upon the inside, the horse becomes lame: to avoid this, they are placed more towards the fore part of the hoof. This causes the heels of the horse to have the greater spring upon the heels of the shoe, which is so very detrimental as to occasion lameness; whereas by using this flat form of shoe, all these inconveniences are avoided; and if the hoofs of young horses from the first time that they were shod, were continued to be constantly treated according to the method here recommended, the heels would always retain their natural strength and shape. By following this flat method of shoeing, and manner of treating the hoofs, several horses now under this management, that were formerly tender-footed, and frequently lame, while shod with broad concave shoes, are now quite sound, and their hoofs in as good condition as when the first shoes were put upon them. It is thought that if farriers considered attentively the design of shoeing horses, and would take pains to make themselves acquainted with the anatomical structure of the foot, they would then be convinced, that this method of treating the hoofs, and this form of shoe, is preferable to that which is so generally practised. But it has been alleged, that in this form of shoe, horses do not go so well as in that commonly used. This objection will easily be set aside, by attending to the following particulars. There are but few farriers that can or will endeavour to make this sort of shoe as it ought to be. The iron, in forming it, does not so easily turn into the circular shape necessary, as in the common shoe; and perhaps this is the principal reason why they object to it, especially where they work much by the piece. And as many horses that are commonly shod with concave shoes have their soles considerably higher than the crust, if the shoe is not properly formed, or if it is made too flat, it must unavoidably rest upon the sole, and occasion lameness. Further, that the practice of paring the sole and frog is also so prevalent, and thought so absolutely necessary, that it is indiscriminately practised, even to excess, on all kinds of feet; and while this method continues to be followed, it cannot be expected that horses can go upon hard ground, on this open shoe, with that freedom they would do if their soles and frogs were allowed to remain in their full natural strength. Experience teaches us, that in very thin-soled shoes, we feel an acute pain from every sharp-pointed stone we happen to tread upon. Horses are sensible of the same thing in their feet, when their soles, &c. are pared too thin. Hence they who are prejudiced against this method, without ever reflecting upon the thin state of the sole, &c. are apt to condemn it, and draw their conclusions more from outward appearances than from any reasoning or knowledge of the structure of the parts. From a due attention likewise to

SHOEING.

the structure of a horse's foot in a natural state, it will be obvious, that paring away the sole, frog, &c. must be hurtful, and in reality is destroying that substance provided by nature for the defence of the internal parts of the foot: from such practice it must be more liable to accidents from hard bodies, such as sharp stones, nails, glass, &c. From this consideration we shall likewise find, that a narrow piece of iron, adapted to the shape and size of the foot, is the only thing necessary to protect the crust from breaking or wearing away; the sole, &c. requiring no defence if never pared. But there is one observation farther necessary to be made; which is, that the shoe should be made of good iron, well worked, or what smiths call hammer-hardened, that is, beaten all over lightly with a hammer when almost cold. It is well known, that heating of iron till it is red softens it greatly; and when the shoes thus softened are put upon horses' feet, they wear away like lead. But when the shoes are well hammered, the iron becomes more compact, firm, and hard; so that a well-hammered shoe, though made considerably lighter, yet will last as long as one that is made heavier; the advantage of which is obvious, as the horse will move his feet with more activity, and be in less danger of cutting his legs. The common concave shoes are very faulty in this respect; for, in fitting or shaping them to the foot, they require to be frequently heated, in order to make them bend to the unequal surface which the hoof requires from the constant use of these shoes; they thereby become soft, and to attempt to harden them by beating or hammering when they are shaped to the foot would undo the whole. But flat shoes, by making them when heated a little narrower than the foot, will, by means of hammering, become wider, and acquire a degree of elasticity and firmness which it is necessary they should have, but impossible to be given them by any other means whatever; so that any farrier from practice will soon be able to judge, from the quality of the iron, how much a shoe, in fitting it to the circumference of the hoof, will stretch by hammering when it is almost cold: this operation in fitting flat shoes will be the less difficult, especially when it is considered, that as there are no inequalities on the surface of the hoof (or, at least, ought not to be) which require to be bended thereto, shoes of this kind only require to be made smooth and flat; hence they will press equally upon the circumference or crust of the hoof, which is the natural tread of a horse. And a preference has lately been given by Mr. Moorcroft to this kind of shoe, which he calls the "seated shoe," and which he has formed in a die, in the same manner as money is struck in coining. The upper surface of this shoe consists of two parts; an outer part, which is a perfect plane near the rim, corresponding with the breadth of the crust, and called the *seat*; and an inner part, sloping from the seat, and distinguished by the name of the *bevel*. The seat is obviously intended to support the crust in its whole extent, the bevel to lie off the sole; and this part being more or less broad, according to the kind of work proposed to be done, will give the requisite strength to the shoe. As the whole of the crust bears on the seat, it is less liable to be broken than when only a small part of it rests on the shoe. In consequence, likewise, of the crust resting on the flat seat, the weight of the body has a tendency to spread the foot wider in every direction, rather than to contract it, as has been observed to happen with the common shoe, and when afterwards shod with the seated one, it has become wider without the horse having been taken from his usual work; and again, it is observed, that a foot being of a full size and proper form when first shod with the seated shoe, has retained the same size and form without the slightest alteration, as long as the seated shoe was used. By the slope or bevel in the

shoe, a cavity is formed between it and the sole, sufficient to admit a picker, and to prevent pressure on this part, without the sole itself being hollowed, and consequently weakened. For if it be one of the functions of the horny sole to defend the sensible sole, of which, from its situation and nature, no one can doubt, it must be evident that the more perfect it is left, the stronger it must necessarily be, and of course the more competent to perform its office. And though he cannot be sanguine enough to suppose that this shoe will prevent lameness in every case, there is nevertheless sufficient proof from experience to assert, that it will diminish its frequency. Some strong objections have however been made to this form of shoe by Mr. Coleman. If it should be found, where the shoe is applied, that the sole very frequently receives pressure, then we shall demonstrate that the practice is incompatible with the principle. If it be good practice for the sole to receive pressure, then the principle must be erroneous that attempts to make the shoe rest totally on the crust; and if the principle be well founded for the crust only to support the shoe, then, if the sole be in contact with the shoe, the practice must be imperfect. Except a model is taken to every horse's foot, it is impossible for the resting-place of the shoe precisely to fit the crust; for the crust not only varies exceedingly in different horses, but in the same hoof at different parts. The flat surface, therefore, that is only broad enough for the toe, is frequently too broad for the quarters and heels. And in all the shoes he has ever seen of this description, the flat part of the shoe is made of the same breadth at the quarters as at the toe. It is farther to be observed, that this surface very generally exceeds the crust at every part. In the same proportion as the seat of the shoe exceeds the breadth of crust, exactly so much of a flat surface is opposed to an equal quantity of sole. The principle of this shoe is therefore defeated by the practice; for, instead of the seat resting on the crust, it projects over the edge of the sole. It is therefore a fact, that while great pains have been taken to make a flat seat on the shoe, in order to support the crust only, and the web concave, in order to remove pressure from every part of the sole, that the seat has nevertheless very rarely fitted the crust; and consequently the soles of all flat feet, at their connection with the crust, must receive more or less of pressure from the seat of the shoe. Where the sole is concave, this shoe will only rest on the crust; but a shoe that is flat on its whole internal surface would answer the same purpose; for the concave part of the sole opposite to the concavity of the web of the shoe would receive no pressure, even from a shoe wholly flat. He therefore recommends a shoe which has been found free from these and other objections, and which indeed bids fair to supersede the use of every other kind. But before this is noticed, it may be necessary to mention cursorily the shoes proposed by Mr. St. Bel, and Mr. Taplin; but in fact the changes they have introduced are rather novelties than improvements. Mr. St. Bel has indeed committed a great error, that of promoting the arched form of the horse's foot, and thus raising the frog out of the way of pressure, a practice highly injurious to the animal.

It is indeed observed, in respect to Mr. St. Bel's mode of shoeing, by Mr. Coleman, that he employed a shoe with a flat upper surface; but, from not attending to the very important operation of removing the sole under the heels of the shoe, to every kind of hoof, it frequently failed of success. But that the best form of the external surface of the shoe is a *regular concavity*, that is, the common shoe *reversed*. This shoe leaves the hoof of the same figure when shod, as before its application. And it is evident, that a concavity has more points of contact with pavement and other convex

SHOEING.

convex bodies than a flat or convex surface, and that the horse is consequently more secure on his legs. A shoe that is flat externally, may preserve the hoof equally well in health; but this form is not so well calculated to prevent the horse from slipping as a concavity.

And in explaining the principles and practice of shoeing, it is supposed there are two circumstances necessary to be attended to, *viz.* to cut the hoof and apply the shoe. Before the hoof is protected by iron, some parts require to be removed, and others preserved. This is even of more importance than the form of the shoe. But many have attended chiefly to the shoe, and not to its application or to the hoof; and this error has produced more mischief and more enemies to the Veterinary College, than all the prejudices and calumnies of grooms and farriers. The first thing to be attended to, is to take away a portion of the sole between the whole length of the bars and crust with a drawing knife; for the heels of the sole cannot receive pressure without corns. To avoid this the sole should be made concave, so as not to be in contact with the shoe. If there be any one part of the practice of shoeing more important than the rest, it is this removal of the sole between the bars and crust. When this is done, the horse will always be free from corns, whatever may be the form of the shoe. Besides this, the heels of the shoe should be made to rest on the junction of the bars with the crust; whereas, if the bars are removed, the shoe is supported by the crust only, and not by the solid broad basis of crust and bars united.

And it is added, that it is necessary that the sole should be cut before any other part of the hoof be removed. If the heels have been first lowered by the butteris, then possibly there may not be sufficient sole left to enable a drawing-knife to be applied without reaching the sensible sole; whereas, by cutting the sole in the first instance, we can determine on the propriety of lowering the heels and shortening the toe. The sole can then descend, without the motion being obstructed by the shoe; and any foreign bodies that may have got into this cavity are always forced out when the sole descends, without producing any mischief. When the shoe is applied, the cavity between the sole and shoe should be sufficiently large, at every part, to admit a large horse-picker, and particularly between the bars and crust. If the sole is naturally concave, a shoe with a flat surface applied to the crust, will not touch any part of the sole; and if the sole be flat, or even convex in the middle, or towards the toe, the quarters and heels of the sole will generally admit of being made concave with a drawing-knife, so as not to receive any pressure from a flat shoe. If a shoe with a flat upper surface does not leave ample space for a picker between the sole and shoe, then it is requisite to make either the sole or the shoe concave. When the sole appears in flakes, and thick in substance, it will be better to make the whole of the sole concave by a drawing-knife; and this operation should always be performed before the toe is shortened or the heels lowered. When we have made the sole hollow, then a shoe with a flat surface will rest only on the crust; but if the sole be flat, or convex, and thin towards the toe and middle of the hoof, so as to prevent the possibility of removing the sole at these parts, to form a concavity, then it is necessary to employ a shoe sufficiently concave to avoid pressure, and to admit a picker. In this case, however, the sole at the heels and quarters, even in convex feet, will generally allow of removal with a drawing-knife, and then the quarters and heels of the shoe may be flat. It therefore follows, that where the sole can be made concave, a shoe with a flat surface may with safety be applied; but where parts of the sole, from disease or bad shoeing, become flat, a shoe with a

concave surface is required. As the hoof is always growing, and as the shoe preserves it from friction, the toe of the crust requires to be cut once in about twenty-eight days. The more horn we can remove from this part, the sooner it will be proper to apply a shoe thin at the heels, without mischief to the muscles and tendons, and the horse will be less liable to trip.

And it is stated that the bars and frog should never be removed. What is ragged and detached had better be cut off with a knife by the groom than left to the farrier, who will perhaps remove some of the sound parts. Where the frog is not large and projecting, the heels may be lowered by a rasp, or the butteris, for in every case we are to endeavour to bring the frog in contact with the ground. The frog must have pressure, or be diseased. Nevertheless, when the frog has been diseased for a considerable period, and become soft, it must be accustomed to pressure by degrees. If the quarters are high, and much exceed the convexity of the frog, we should gradually lower the heels, and endeavour to bring the frog and heels of the shoe on the same parallel line. Where work is required of the horse, while the frog is soft and diseased, it may be gradually used to pressure, by lowering the hoof about the tenth of an inch every time of shoeing, until the frog be hard, and equally prominent with the heels; or if the horse is not wanted, great advantage would be derived from his standing without shoes on a hard pavement. But the feet of horses are so variously deformed by bad management, it will be requisite in shoeing to attend to each particular kind of hoof. If any form of shoe be indiscriminately applied for all kinds of feet, it must frequently fail of success: but by proper attention to the different hoofs, we can generally improve the whole foot, so as to employ the shoes recommended at the Veterinary College. And, after the hoof has been properly prepared, then it is requisite to apply a shoe, and to vary its length, breadth, and thickness at the heel, surfaces, &c. according to the hoof. If the heels of the fore-feet are two inches and a half, or more, in depth, the frog sound and prominent, and the ground dry, then only the toe of the hoof requires to be shortened, and afterwards protected by a short shoe made of the usual thickness at the toe, but gradually thinner towards the heel. For a common sized saddle-horse, it may be about three-eighths of an inch thick at the toe, and one-eighth at the heel. The intention is, to bring the frog completely into contact with the ground, to expand the heels, prevent corns, thrushes, and canker. If applied in May or June, when the ground is dry, it may be continued all the summer; and in warm climates, where this is the case, no other protection for the hoof is requisite. And he adds, that so long as the wear of the hoof is not greater than the supply afforded by nature from the coronet, so long may the short shoes be worn; but in wet weather this is not the case; he has known some light horses to wear them the whole year; but such instances are not common. Nevertheless, the short shoe can be employed on most horses with advantage in summer, when the heels are from two and a half to three inches in depth, and the frog equally prominent; but, unless the hoof has been properly preserved, the heels and frog are generally too low for the short shoe. The toe of the horse requires to be shortened as much as possible; but if the frog touches the ground, no part of the heels should be cut; and, by pursuing this practice, the heels will frequently grow sufficiently high to receive the short shoe. After speaking of the application of the short shoe to running horses, it is stated, that during the wet months, we protect the whole crust by a long shoe; and if the heels of the hoof are low, we employ the same shoe in summer. In winter, when the heels are too

SHOEING.

high, it is better to lower them moderately with a rasp, than to wear them down with a short shoe, as the wet may cause more horn to be destroyed than is necessary to be removed; but it cannot be too often repeated, that the sole between the bars and crust should be taken out before the heels are cut. If the heels are first removed, then possibly the horn left will be insufficient to afford a proper degree of concavity between the bars and crust. Where very high-heeled shoes have been worn, the frog would be liable to injury, as well as the muscles and tendons that bend the leg, from the sudden application of a shoe made thin at the heels. Indeed, whether the shoe or hoof be the cause that elevates the frog, the attention is required to bring it gradually into contact with the ground. We therefore thin the heel of the shoe by degrees, that the frog may become accustomed to hard pressure. The thickness of the last shoe at the heel will always furnish a proper criterion for that to be next applied. If only a small portion of the hoof can be taken from the toe, the heel of the new shoe should be about one-tenth of an inch thinner than the shoe removed; and the growth of the crust will generally be equal to this diminution of iron. By reducing the heels of the shoe in the same proportion as the hoof grows, a thin-heeled shoe may, in a few months, be employed; and yet the horn being preserved at the heels, and cut at the toe, every time of shoeing, the heels (shoe and hoof together) will be as high, and frequently higher, than when the former thick-heeled shoes were employed. The crust that descends at the heels we allow to remain; but subtract an equal quantity of iron from the heels of the shoe, and as much horn as possible from the toe of the hoof. This system should be continued till the heels of the shoe are about one-third the thickness of the toe. In proportion as the crust from the coronet to the toe increases, and the heels decrease in depth, the back sinews and muscles will be put on the stretch. And the converse of this must be equally true, that as the heels are high and the toe short, the muscles and sinews are relieved. It therefore follows, that every atom of horn or iron taken from the toe of the crust, or shoe, tends to relax the parts behind, and that the removal of horn or iron from the heels produces the opposite effect. If these simple facts are kept in view, there can be no difficulty in ascertaining the quantity of iron that may be removed with safety from the heels of any shoe, without danger of mischief to the muscles and tendons.

But in the shoeing of horses that are liable to *cut*, the following useful directions have been given by Mr. Moorcroft. It is contended, that in order to prevent a horse from striking the foot or shoe against the opposite leg, by which it is often bruised or wounded, is an important point; inasmuch as this accident occurs very frequently, and it not only blemishes and disfigures the leg, but also endangers the safety of the rider. The parts struck in the hind-leg, are the inside of the fetlock-joint, and the coronet; in the fore-leg, the inside of the fetlock-joint, and immediately under the knee; which latter is called the *speedy cut*, from its happening only when a horse goes fast. Young horses, when first backed, generally cut their fore-legs, although naturally they may be good goers. This arises from their placing the foot on the ground too much under the middle of the breast, in order the better to support the burthen to which they are unaccustomed; but by degrees they acquire the method of balancing the weight, with the foot in the same direction it would naturally have been without it. It may, therefore, he thinks, be laid down as a general rule with such horses, that, till they regain their natural method of going, the edge of the inner quarter of the shoe should follow exactly the outline of the crust, but should not be set

within the crust, nor should the crust itself be reduced in thickness; as both these practices tend to weaken the inner quarter, and to deform the hoof. And here it must be observed, that the outer edge of the shoe should, in all cases of sound feet, follow exactly the outer edge of the crust, except just at the heel, where it should project a little beyond the line of the hoof. Also, that horses with narrow chests, having their legs placed near together, are apt to cut when they begin to tire; and with these the practice just mentioned should always be employed. Horses that turn their toes much outwards are, of all others, most subject to cut. But in reply to the assertions of some, that this accident also happens to such horses as turn the toes much inwards, he denies having met with a single instance of the kind. In horses of the first description, it has been long observed, that the inner quarters of the hoof were lower than the outer, and that the fetlock-joints were nearer each other than in horses whose feet pointed straight forwards. These two facts probably led to a conclusion, that if the inner quarters were raised to a level with the outer, and so much the more as they were made proportionably higher, that the fetlock-joints would be thrown farther apart, so as to admit of the foot passing by the supporting leg without striking the joint. Accordingly, for the two last centuries, at least, it has been usual to make the inner quarter of the shoe higher than the outer; and not only has this been the general practice, but it has been regularly recommended by almost every writer from that time to the present. And notwithstanding this method has very frequently failed of success, yet repeated disappointment appears never to have led to the circumstance of questioning the truth of the principle. Nay, indeed, the reliance placed upon it has been so strong, probably from the simplicity of the reasoning on which it was founded, that in the cases where it most particularly disappointed expectation, its failure was generally attributed to the practice not being carried sufficiently far; and accordingly the shoe has been still more raised on the inner quarter, and the edges of the crust and shoe have been filed away. When these expedients likewise failed, the last resource has been, a circular piece of leather placed round the joint to receive the blow of the foot.

It is noticed, that about four years ago, a shoe, with the outer quarter thick and the inner one thin, was applied in a case which had baffled many attempts on the old plan. On the first trial the horse ceased to cut, nor has he ever done it since; which can only be attributed to his having constantly worn the same kind of shoe. And other bad cases, which have occurred occasionally since that period, have been treated in the same way, and with the same success, although for a long time he was at a loss how to explain them. If the action of cutting principally depends on the faulty position of the fetlock-joints, and of the feet with respect to each other, and it seems generally agreed that such is the fact, it should seem that a means which, by raising the outer quarters, must throw the fetlock-joints still nearer to each other, would necessarily increase the defect in question; but as the reverse of this actually takes place, it might induce a suspicion that there exists some other cause of cutting which has been hitherto overlooked. For horses which cut their hind-legs, the shoe, at the outer heel, should be from half an inch to an inch in thickness, according to the kind of horse, and to the degree in which he may cut. The web of the shoe should gradually become thinner till it reaches the toe, which should be of the ordinary thickness, and from which it should slope off, and end like a tip in the middle of the inner quarter. For horses which cut only in a slight degree, a shoe of the same thickness throughout, but reaching on the inner quarter only as far as the middle of the foot,

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SHOEING.

will in most instances be found sufficient. This shoe, in point of effect, would be equally proper for the fore-feet, were it not that in such horses as are used for the saddle, the fore-feet, being more charged with weight than the hind-feet, are more particularly subject to be injured, and a horse thus shod on the fore-feet might go unsafe: therefore, it is expedient to let the inner quarter of the shoe be thin, and reach to the heel; but the outer edge should be bevelled off, so as to slope inwards. The same kind of shoe is equally well calculated to prevent the speedy cut; observing to bevel off more strongly the part which strikes, and not to put in any nails thereabouts. And here it may be proper to remark, that in sound feet, the heel of the shoe should reach as far on the heel of the hoof as to admit of the angle formed by the crust, and the bar resting fully upon it; but it should not be carried quite as far as the end of the heel of the hoof. But in order to ascertain what would happen to a horse shod with different kinds of shoes, the following trials were made.

Experiment 1. A horse with a narrow chest, who had never cut, and having parallel shoes on his fore-feet, was trotted at about the rate of eight miles an hour, in a straight line, over ground sufficiently soft to retain slightly the impressions of the shoes, but not to admit the feet to sink into it. Then two parallel lines were drawn along the track, including between them the prints of the shoes. By these it was found, that there was regularly a distance of nine inches and a half between the outer edge of the near fore-shoe and that of the off fore-shoe.

2. Shoes thick in their inner quarter, and like a tip, reaching only half way on the outer quarter, were then used; and it appeared that the distance between the outer edges of the prints of the shoes, taken as before, was regularly reduced to eight inches and a half.

3. The same shoes were afterwards placed on the opposite feet, so that the thick heel was on the outer quarter; and the result, under circumstances exactly the same as in the foregoing experiments, was, that the distance between the outer edges of the prints of the shoes was regularly increased to eleven inches. To account for these results, it is necessary to attend closely to the different effects produced by the weight of the fore part of the body acting upon the two fore-feet, when raised on the inner or outer quarters, during the opposite states of rest and action. And first, with regard to shoes raised on the inner quarter: whilst a horse so shod is standing still, the fetlock-joints are certainly thrown farther apart than when any other kind of shoe is used. Hence it was concluded, that the limb which supported the body would have its fetlock-joint thrown so much outwards, as to keep it completely out of the way of the foot in motion. But it appears that the impressions made on the ground by such shoes are an inch nearer together, than those made by parallel shoes, and two inches nearer together than those made by shoes raised on the outer quarter. And this may be thus explained: when the horse is at rest, the weight is supported equally by the two fore-feet; but the instant one foot quits the ground, the weight is suddenly transferred to the other; and by the outer quarter being lower than the opposite one, the fore part of the horse has a tendency to fall over to the outside. To prevent this, the moving foot is suddenly brought close to the fetlock of the supporting foot, in order to relieve it by catching the weight; and the foot itself is placed on the ground too much under the middle of the breast. The same circumstance occurs to both feet in their turn: and the horse, being thus in constant danger of falling to one side or to the other, is constrained to bring his feet near together to pre-

serve his balance; and in doing this, strikes the foot against the opposite fetlock. And it frequently happens, that the more the toes are turned outwards, the nearer the fetlock-joints are brought together, and the more the horse is disposed to cut. However, this is true only to a certain extent; for if this faulty position of the lower part of the leg be carried artificially beyond a given point, instead of producing an increased degree of cutting, in most instances it remedies the defect altogether. The reason of this is just the reverse of what takes place when the inner quarter is raised; that is to say, when the weight of the fore part of the body rests only upon one leg, it bears too much upon the inner quarter, from its being lower than the outer quarter; and thus the horse has a tendency to fall over to the inside of the supporting leg. To prevent this, the moving foot is thrown farther from the supporting leg, in order to maintain the balance: and thus the foot misses the fetlock-joint.

In cases where the roads are covered with ice, it becomes necessary to have the heels of horses' shoes turned up, and frequently sharpened, in order to prevent them from slipping and falling; but this cannot be done without the frequent moving of the shoes, which breaks and destroys the crust of the hoof where the nails enter. To prevent this, it has been recommended to those who are willing to be at the expence, to have steel points screwed into the heels or quarters of each shoe, which might be taken out and put in occasionally. And the method of doing this properly, as laid down by Mr. Clark, is first to have the shoes fitted to the shape of the hoof, then to make a small round hole in the extremity of each heel, or in the quarters, about three-eighths of an inch diameter, or more, in proportion to the breadth and size of the shoe: in each of these holes a screw is to be made. The steel points are likewise to have a screw on them, exactly fitted to that in the shoes. Care must be taken that the screw on the points is no longer, when they are screwed into the shoe, than the thickness of the latter. The steel points are to be made sharp: they may either be made square, triangular, or chisel-pointed, as may be most agreeable. The height of the point above the shoe should not exceed a quarter of an inch, for a saddle-horse; they may be made higher for a draught-horse. The key or handle, that is necessary to screw them in and out occasionally, is made in the shape of the capital letter T, and of a sufficient size and strength. At the bottom of the handle a socket or cavity must be made, properly adapted to the shape of the steel point, and so deep as to receive the whole head of the point that is above the shoe. In order to prevent the screw from breaking at the neck, it will be necessary to make it of a gradual taper. The same is likewise to be observed of the female screw that receives it; that is, the hole must be wider on the upper part of the shoe than the under part. The sharp points may be tempered or hardened, in order to prevent them from growing too soon blunt; but when they become blunt, they may be sharpened as at first. These points should be uncrowded, when the horse is put into the stable; as the stones will do them more injury in a few minutes than a day's riding on ice. A draught-horse should have one on the point of each shoe, as that gives him a firmer footing in drawing on ice; but for a saddle-horse, when points are put there, they are apt to make him trip and stumble. And when the shoes are provided with these points, a horse will travel on ice with the greatest security and steadiness, much more so than on causeway or turnpike roads, as the weight of the horse presses them into the ice at every step. And in addition to the common shoe for horses that have sound feet, there are also others

others of various shapes, determined by the necessity of the case, as by the different derangements and diseases to which the horse's foot is liable. See **SHOE**.

SHOEING of the Ass and Mule. With respect to what concerns the shoeing of other animals, Mr. Clark thinks that the mule, being an animal uncommon in this country, the ass of no great value, and the ox not generally employed in labour, it is needless to say much on the subject. The shoe for the fore-feet of the mule is very similar to that which the farriers call the *bar-shoe*. It is very wide and large, especially at the toe, where it sometimes projects four inches and upwards beyond the hoof. This excess is given it with a view to enlarge the basis of the foot, which is in general exceedingly narrow in this animal. The shoe for the hind-feet is open at the heels, like the horse's shoe; but it is lengthened at the toe, like the preceding one. And it is added, that the foot of the ass, having the same shape as that of the mule, requires the same kind of shoe, with this only difference, that the shoe of the fore-foot is not closed at the heels, and that its edges do not project so much beyond the hoof. The same form of shoe is used for the hind-feet of this animal.

SHOEING of Oxen, the business of fixing shoes upon animals of this kind, and which is constantly necessary wherever they do any sort of field or road labour; but it is a practice which is yet far from being performed in a perfect manner. Mr. Clark remarks, that in many parts of France, where the ox is used for draught, it is sometimes necessary to employ eight shoes, one under each nail; or four, one under each external nail; and sometimes only two, one under the external nail of each fore-foot. In this country two pieces, or shoes, to each foot are generally, however, made use of; being mostly fixed on, especially in the northern districts, with three or four large-headed nails to each shoe. They are fitted on in a similar manner to those of the horse. But from the shoes of these animals being, from the smallness of the pieces, so liable to break, it has been suggested to have them shod with whole shoes, in the manner of the horse; but how far this is a practice that will answer, must depend upon future trials. It is probable, that in this way the foot will be too much confined to succeed in any very perfect manner. Where oxen are left without shoeing, they are continually liable to become lame, and to be incapable of going on with their work. As there is much trouble in the shoeing these animals, from its being necessary to cast them each time, it has been found requisite to have recourse to contrivances for shoeing them standing. See **OX-SHOEING Machine**.

SHOEMAKERS' CHIPS, in *Agriculture*, the refuse cuttings pared off in making shoes, which, when collected in sufficient quantity, are found useful as a manure. See **MANURE**.

SHOENECH, in *Geography*, a Moravian settlement in Pennsylvania, near Nazareth, begun in 1757.

SHOESHARMO, a town of Little Bucharia; 60 miles S.W. of Aclu.

SHOGLE. See **CHOUG**.

SHOKET, a town of Syria, in the pachalic of Damascus, on the Orontes; 22 miles S. of Antakia.

SHOLAVENDEN, a town of Hindoostan, in Madura; 14 miles W.N.W. of Madura.

SHOLAVERAM, a town of Hindoostan, in the Marwar; 14 miles S. of Tripatore.

SHOLINGUR, a town of Hindoostan, in the Carnatic; 20 miles S. of Bomrauzepollam.

SHOOCAMPETTY, a town of Hindoostan, in Coimbatore; 5 miles S.S.W. of Caroor.

SHOODS, in *Rural Economy*, a provincial term applied to hulls.

SHOOLARUMBOO, in *Geography*, a town of Hindoostan, in the province of Dindigul; 17 miles N.N.W. of Dindigul.

SHOOLERAMCOTTA, a town of Hindoostan, in the province of Dindigul; 7 miles N. of Dindigul.

SHOOMTSHA, one of the Kurile islands, the nearest to Kamtschatka. The channel between the Lopatka and this island is 15 versts broad. The length of the island from N.E. to S.W. is 50, and the breadth 30 versts. The land is low, with moderate ridges of hills. The eastern coasts, about the middle of the island, form steep shores and rocky shelves, and are for some way into the sea studded with rocks. Here is one, and it is said that a vein of silver has been formerly worked. In the centre of the island is a lake, five versts in circuit, which flows by a streamlet into the sea. In this are caught fine salmon, and several other kinds of fish. There are no standard trees upon the island, but merely bushes of alder, willow, and an espalier kind of pine, or Siberian cedar, on which grow little cedar-nuts. The inhabitants are not genuine Kuriles, but of Kamtschadale descent; of these 46 persons pay tribute. N. lat. 51° 25' to 52°. E. long. 156° 14'.

SHOOR, a town of Hindoostan, in Lahore; 15 miles S.E. of Kooshaub.

SHOOT, in *Agriculture*, the young branch of any sort of plant, which is afforded in one season. It also signifies a young animal of the cattle kind, in some districts.

SHOOT, in the *Sea Language*. They say the ballast shoots, when it runs over from one side to another.

SHOOTE, among neat cattle, an affection of the bowel kind, with which calves are often attacked a few days after calving. The usual symptoms are, first, a colic or pain that is more or less violent, and is frequently very severe and dangerous, especially when it is contagious. This colic is terminated, and the calf relieved, by a discharge taking place from the bowels; though this sometimes proves fatal before the shoote appears. Secondly, a loathing and refusing of food, even previous to the discharge; which decreases and increases according to the duration and violence of the disorder. Where the disease prevails, the best medicine which can be administered is that of eggs and flour properly blended with oil, melted butter, and aniseed, linseed, or similar mucilaginous vegetable matters; and milk simply mulled with eggs may be often given with much advantage.

SHOOTER'S HILL, in *Geography*, a hill in the county of Kent, between London and Dartford.

SHOOTING. See **GUNNERY** and **PROJECTILE**.

SHOOTING of Bombs. See **BOMB**.

SHOOTING with Air. See **WIND-GUN**.

SHOOTING, Malicious, in *Law*. See **MAHIM**.

SHOOTING of Salts. It is to be observed, that the figures arising from the shooting of dissolved salts are not constantly the same, but vary according to different circumstances, such as when they happen to shoot more or less hastily, or in different proportions of liquor. See **SALT**.

SHOOTING Point, in *Geography*, a cape of Scotland, on the south coast of the county of Fife, and east side of Largo bay.

SHOOTS, Hot. See **HOT**.

SHOOT, Water. See **WATER**.

SHOP-LIFTER, a person who, on pretence of buying goods or otherwise, takes an opportunity to steal them; and if the goods amount to the value of five shillings, though

though no person be in the shop, he is guilty of felony without benefit of clergy, by 10 & 11 W. III. c. 22.

SHORAB, in *Geography*, a town of Persia, in the province of Segestan; 30 miles W. of Meimend.

SHORAY, a town of Hindoostan, in the circar of Chanderee; 22 miles N. of Kimlassa.

SHORE, JANE, in *Biography*, the concubine of king Edward IV., was the wife of Mr. Matthew Shore, a goldsmith in Lombard-street, London. Historians represent her as extremely beautiful, cheerful, and generous. The king, it is said, was no less captivated with her temper than her person; she never made use of her influence over him to the prejudice of any one; her importunities were always in favour of the unfortunate. After the death of Edward, she attached herself to the lord Hastings; and when Richard III. cut off that nobleman as an obstacle to his ambitious schemes, Jane Shore was arrested as an accomplice, on the accusation of witchcraft. For this she was doomed to a public penance, and to the loss of her property. She was alive, but probably in a very wretched state, under the reign of Henry VIII. when she was seen by sir Thomas More, poor and old, and without the smallest trace of her former beauty. Mr. Rowe, in his tragedy of Jane Shore, has adopted the popular story, related in the ballad, of her perishing with hunger in a place where Shoreditch now stands. But Stow assures us, that this place had its name long before her time.

SHORE, JOHN, a famous performer on the trumpet. Matthias Shore, the father of John, and Colley Cibber's wife, was sergeant-trumpet, in which office he was succeeded, first by his brother William Shore, and afterwards by his son John. His daughter, Mrs. Cibber, had been a scholar of Purcell in singing and playing on the harpsichord; in the exercise of which talents at home, her conquest over the heart of Colley Cibber first began. Purcell, from his connexion with the family, and his admiration of John's performance on the trumpet, took every opportunity in his power to employ him in the accompaniment of his songs and other theatric compositions; and this accounts for the frequent use he made of that martial and field instrument, even when the subject of the poetry was pacific. John Shore lived till the year 1753, when he was succeeded as sergeant-trumpet, by that admirable performer the late Mr. Valentine Snow, whose exquisite tone and fine shake must be still remembered by many persons living, who have heard him at Vauxhall, and in Mr. Handel's oratorios.

SHORE, among *Builders*, &c. See SHOAR.

SHORE, or *Common Shore*, a corruption of *sewer*. See SEWERS.

SHORE, in *Agriculture*, a sort of artificial drain or course formed in low flat lands for the purpose of freeing and relieving them from the collected surface-waters. The want of shores is now most common in waste and unreclaimed lands; but it occasionally occurs in those of other kinds, in wet seasons, to the great injury and prejudice of the prevailing crops, and the future productiveness of the land, as the loitering surface-water can get off in no other way. There are very great extents of even appropriated lands, in some cases, that are greatly damaged and inconvenienced by water lodging and stagnating in the furrows of the ridges and the ditches, for want of having sufficient proper shores, or public drains, for drawing it off; and of public proper laws and regulations for enforcing the re-opening and the cleansing, from time to time, of those which have been formed at former periods; as well as for the preserving of the whole always in a suitably open state.

It is extremely probable, that a large proportion of the

low flat lands of this country, which are now in a somewhat dry condition, were, in their natural state, liable to be at times covered with water. This appears to have been the case, from the compact gluey composition of the soil, and the slight covering of black vegetable earth which still forms the surface of them, where the work of tillage has not been performed upon them. And, from many of such low flat grass lands now lying in a tolerably dry state, from large tracts of those of the arable kind, whose soils are now barely out of the reach of water, which, in wet seasons, fill their drains and ditches to the brim, as well as from the less admissible evidence of tradition in low-lying districts,—it would seem, it is said, to be equally probable, that much industry and exertion have at former periods been employed, to free the lands of this sort in the country from the state in which nature and time had placed them.

The feudal system is supposed to have been particularly favourable to undertakings of this useful kind, and that since its decline, the courts of the manorial description, which succeeded and survived it, have contributed to enforce its beneficial regulations. But that as they have now for the most part lost their power, existence, and authority, or where they are still continued and retain them, what relates to the business of public drains and water-courses, in their management, is too often neglected and overlooked. Hence it is noticed by a late writer, that, "relative to this important department of rural economics and internal policy, the country may be said to have been moving, and, in a general view of it, still continues to move, in a retrograde direction."

In a great number of situations, vast injury and inconvenience are at present sustained from the want of the shores, drains, ditches, and other outlets for drawing off the water being kept properly open and sunk for its discharge into the adjoining rivers, brooks, or seas.

Some sufficient power and authority for the regulation of all matters of this nature should certainly exist in every district of the kingdom; which is not now the case, at least to any full and effectual extent, as many most important benefits and advantages would necessarily result from it, in the management and improvement of lands, as well as in the increase of the produce of it.

It has been suggested, that a great deal may be effected in this way, by the having recourse to the appointment of *juries* for the conducting of the business of *shores* and *water-courses*, wherever there are the slightest remains of the existence of manorial courts. And that, even where there is nothing of this sort to be met with, it would not fail to have a good effect, in many cases, where the lands are considerable, to have *standing inquests*, chosen from among the neighbouring tenantry in an annual or other manner, for the purpose of directing the proper regulation of the public *shores*, *drains*, *water-courses*, and other modes of conveying away the superabundant water from the land.

SHORE, *Sea*, is a general name for the sea-coast of any country. A bold shore is a coast which is steep and abrupt, so as to admit the closest approach of shipping without exposing them to the danger of being stranded.

The shores of the sea are divided, by count Marfigli, into three portions, according to which, all his descriptions, in his account of the basin of the sea, are given. The first part of the shore is that tract of land to which the sea just reaches in storms and high tides, but which it never covers; the second part of the shore is that which is covered in high tides and storms, but is dry at other times; and the third is the descent from this, which is always covered with water.

The *first* part is only a continuation of the continent, and suffers no alteration from the neighbourhood of the sea, except that it is rendered fit for the growth of some plants, and wholly unfit for that of others, by the saline steams and impregnations; and it is scarcely to be conceived by any but those who have observed it, how far inland the effects of the sea reach, so as to make the earth proper for plants, which will not grow without this influence, there being several plants frequently found on high hills and dry places, at three, four, and more miles from the sea, which yet would not grow, unless in the neighbourhood of it, nor will ever be found elsewhere.

The *second* part or portion of the shores is much more affected by the sea than the former, being frequently washed and beaten by it. Its productions are rendered salt by the water, and it is covered with sand, or with the fragments of shells in form of sand, and in some places with a tartareous matter deposited from the water, and the colour of this whole extent of ground is usually dusky and dull, especially where there are rocks and stones, and these are covered with a slimy matter.

The *third* part of the shores is more affected by the sea than either of the others, and is covered with an uniform crust of the true nature of the bottom of the sea, except that plants and animals have their residence in it, and the decayed parts of these alter it a little.

SHORE of Muchul, in *Geography*, a cape of Scotland, on the E. coast of the county of Kincardine, so called from a village near the coast; 3 miles N. of Stonehaven.

SHOREDITCH, **ST. LEONARD**, a parish in the hundred of Ossulston, and county of Middlesex, England, is situated in the northern suburbs of London, and forms one of the twenty-three out-parishes of Middlesex and Surrey, which are mentioned in the bills of mortality. This parish is of great extent, and is divided into four liberties, called the liberties of Churchend, Hoxton, Holywell, and Moorfields. The church, a modern edifice, was opened for divine service in August, 1740, having been erected in place of a very old church, which Ellis, author of the "History and Antiquities of Shoreditch," states to have been of Saxon origin. The ascent to the church is by a double flight of steps leading under a portico, supported by four Doric columns. The body is plain in its architecture, but is well lighted by spacious windows. The steeple, which rises to a very considerable height, has rather a handsome appearance. In the old church were a variety of monuments and brasses in memory of persons of distinguished rank; among whom were the countess of Westmorland (daughter to Edward, duke of Buckingham), who died in 1553; Eleanor, countess of Rutland, who died in 1551; and two sons of the said countess of Rutland; but none of those in the new church possess any interest. This parish abounds with alms-houses, established either by public city companies or by private individuals. In Holywell was anciently a priory for nuns of the Benedictine order, which was founded early in the twelfth century, and possessed a revenue of 293*l.* *per annum* at the time of the dissolution. According to the parliamentary returns of 1811, this parish contained 7658 houses and 43,930 inhabitants. The History and Antiquities of the Parish of St. Leonard Shoreditch, by Henry Ellis, quarto, 1797.

SHOREHAM, **NEW**, a borough and market-town in the half hundred of Fishergate, rape of Bramber, and county of Sussex, England, is situated upon the coast of the English Channel, at the distance of about 6 miles W.

from Brighthelmstone, and 55 miles S. by W. from London. This town is indebted for its origin to the decay of Old Shoreham, which is now a very trifling village, but appears to have been a place of considerable importance in ancient times. New Shoreham is a borough by prescription, and has sent members to parliament since the year 1295, the 23d year of the reign of Edward I. In 1771 it became conspicuous in the annals of electioneering, by the developement of a remarkable scene of corruption practised in the election of members for the parliament then assembled. The returning officer having returned a candidate with only 37 votes, in prejudice to another who had 87, of which he had rejected 76, without assigning any satisfactory reason for so doing, was called upon to account for his conduct at the bar of the house of commons; when he defended himself, by stating that those whom he had queried formed part of a society, called the Christian club, the ostensible object of which was only a mask to cover its real one, the setting the borough to sale to the highest bidder. In consequence of these assertions, the house resolved itself into a committee to inquire into the truth; and being fully satisfied on that head, after a patient investigation, it was resolved to incapacitate the members of the club from voting at elections in future. An act was accordingly passed soon afterwards, by which 69 persons were disfranchised, and the right of voting was declared to belong to every freeholder, above 21 years of age, "who shall have, within the rape of Bramber, a freehold of the clear yearly value of forty shillings; and in such persons as by the usage of the borough have, or shall hereafter have, a right to vote at such elections." By this extension of the elective franchise, the number of voters has increased from about 200 to 1200 persons.

The church of New Shoreham is a curious and interesting specimen of ancient Norman architecture. At present only the east end is fitted up and appropriated to divine service, as the nave, or part westward of the tower, has been entirely destroyed. It consisted of a nave, transept, tower, and choir; and by its style of architecture, appears to have been built near the end of the twelfth century. See a beautiful engraving of it in Cooke's "Southern Coast of England."

New Shoreham is governed by two constables, annually elected, who are the returning officers. The market-day is Saturday, weekly; and there is a fair on the 25th of July. It was formerly a town of more relative note than at present, and had a priory of Carmelite or White Friars, founded by sir John Mowbray, knt.; as also an hospital dedicated to St. James. It is chiefly remarkable, however, for being built upon the spot where Ella, the Saxon, landed, with supplies from Germany in aid of his countrymen, Hengist and Horsa. According to the parliamentary returns of 1811, the parish contains 168 houses, and 770 inhabitants. History of the Boroughs of Great Britain, and the Cinque Ports, 3 vols. 8vo. 1792. Beauties of England and Wales, vol. xiv. by F. Shoberl, 1813.

SHOREHAM, a township of America, in the state of Vermont, and county of Addison, on the E. side of lake Champlain; containing 2033 inhabitants.

SHOREHAVEN, a sea-port on the south coast of the island of Stromfoe, with a good harbour, called Tros. N. lat. 61° 40'. E. long. 11° 7'.

SHORL, in *Mineralogy*. See **SCHORL**.

SHORLING and **MORLING**, in our *Old Writers*, words used to distinguish fells of sheep; *shorling* being the fells after the fleeces are shorn off the sheep's back; and *morling* the fells flead off after they die or are killed. In some parts of England they understand by a *shorling*, a sheep whose

whose fleece is shorn off; and by a *morling*, a sheep that dies.

SHORN VELVET. See **VELVET**.

SHORT, THOMAS, in *Biography*, a physician of the early part of the last century, and the author of many works relating to chemistry, meteorology, and medicine. Few particulars are recorded of his life, which seems to have been spent more in the pursuit of science, than in the exercise of his profession. He was a member of the Royal Society. The following are the principal works which he left. "Memoir on the Natural History of Medicinal Waters," 1725. "A Dissertation on Tea," 1730. "Natural History of the Mineral Waters of Yorkshire, Lincolnshire, and Derbyshire," 1733. "A General Chronological History of the Air, Weather, Seasons, Meteors, &c. for the Space of 250 Years," 1749. "Discourses on Tea, Sugar, Milk, made Wines, Spirits, Punch, Tobacco, &c." 1749. "New Observations, Natural, Moral, Civil, Political, and Medical, on Bills of Mortality," 1750. See **ELOY**, **DICT.** **HIST.** and the Works of **Short**.

SHORT, JAMES, an eminent optician, was born at Edinburgh in the year 1710. At the age of ten he lost his parents, and being left in a state of indigence, he was admitted into Heriot's Hospital, where he soon shewed a fine mechanical genius, by constructing for himself a number of curious articles with common knives, or such other instruments as he could procure. At the age of twelve he was removed from the hospital to the High-school, where he shewed a considerable taste for classical learning, and he soon became at the head of his forms. He was intended for the church, but after attending a course of theological lectures, he gave up all thoughts of a profession, which he found little suited to his talents, and from this period he devoted his whole time to mathematical and mechanical pursuits. He was pupil to the celebrated Maclaurin, who perceiving the bent of his genius, encouraged him to prosecute those particular studies for which he seemed best qualified by nature. Under the eye of his preceptor he began, in 1732, to construct Gregorian telescopes; and, as the professor observed, by attending to the figure of his specula, he was enabled to give them larger apertures, and to carry them to greater perfection, than had ever been done before him.

In 1736 Mr. Short was invited to London by queen Caroline, to instruct William, duke of Cumberland, in the mathematics; and on his appointment to this office, he was elected a member of the Royal Society, and patronized by the earls of Macclesfield and Morton. In the year 1739 he accompanied the former to the Orkney islands, where he was employed in making a survey of that part of Scotland. On his return to London he established himself as an optician, and in 1743, he was commissioned by lord Thomas Spencer to make a reflector of twelve-feet focus, for which he received 600 guineas. He afterwards made several other telescopes of the same focal distance, with improvements and higher magnifiers: and in 1752 he completed one for the king of Spain, for which, with the whole apparatus, he received 1200*l*. This was the noblest instrument of the kind that had ever been constructed, and has probably not been surpassed, unless by the grand telescopes manufactured by Dr. Herschel.

Mr. Short was accustomed to visit the place of his nativity once every two or three years during his residence in London, and in the year 1766 he paid his last visit to Scotland. He died in June 1768, after a very short illness, when he was in the 58th year of his age. His eminence as an artist is universally admitted, and he is spoken of by

those who knew him from his youth upwards, as a man of virtue and very amiable manners.

SHORT Accent, in *Grammar*. See **ACCENT**.

SHORT Crooks, in *Agriculture*, are a sort of crooks, which are formed of bent pieces of wood of the oak or elm kind, and so contrived as to be fixed on the horse's back, the ends or crooks turning up, so as to secure the loads on them. They are in use in the counties of Devon and Cornwall, in the latter of which they have both short and long crooks, as they term them, which are made use of for carrying sheaf-corn, hay, faggot, billet-wood, slate, and flag-stones. They are a relic of the old mode of carrying loads in hilly districts. Single-horse carts would probably answer the purpose in a far better way. See **CART**.

SHORT Grass, in *Gardening*, a term applied to the pieces of grass which are kept in a continually mown, short, close state, as on lawns, and in pleasure-grounds, or other situations about country residences. The portions of mown or short grass about seats and houses of the above sort in the modern improved modes of laying out pleasure-grounds, are mostly much more confined in their limits than was formerly the case; as they are not only troublesome, but very expensive in keeping in that proper order and neatness which is necessary for the purpose of ornamental effect, and the utility of walking upon them as occasion may require; and because a much better and more natural effect is found capable of being produced without them; while at the same time the lands can be rendered useful in supporting animals, and of course no loss be sustained.

Where pieces of short grass are, however, formed, and to be kept in order, it will be necessary to roll, mow, and sweep up the grassy litter in a clean neat manner from them once or oftener in the course of the week during the spring season, and frequently at other times. The refuse litter, thus procured, may be employed for different garden purposes, where it cannot be converted to better uses. See **LAWN** and **PLEASURE-Ground**.

It is mostly in too dirty a state to be applied as food for any sort of cattle stock.

SHORT-Grass Scythe, that sort of tool of this kind which is employed in mowing short grass. Scythes for this use should be rather short, and laid in the shaft with the edges low, in order that the grass may be cut in a close neat manner, without leaving any scythe ridges or bulks, as they are usually termed. The swathes or scythe casts, in performing this sort of mowing, are commonly made narrow, in the intention, that the grass may be well and levelly cut out of the bulks or parts under the swathes, and by such means have a more neat and even appearance. See **SCYTHE**.

SHORT Smalls, in *Agriculture*, a sort of oat, which is so named on account of its remarkable shortness. It is much grown in the county of Essex, and is a thick, full, weighty sort, that succeeds well on moist lands of the more dry kind. See **OATS**.

SHORT Sails, in a *Man of War*, are the same with *fighting sails*, being the fore-sail, main-sail, and fore-top-sail, which are all that are used in fight, lest the rest should be fired and spoiled: besides the trouble of managing them when a ship gives chase to another.

If a chase shews a disposition to fight, they say the chase *strips into her short sails*, i. e. puts out her colours in the poop, her flag at the main-top, and her streamers or pendants at the yard's arms; furls her sprit-sail, peeks her mizen, and flings her main-yard.

Teshorten Sail. See **SAIL**.

SHORTFORD, *q. d. fore-cloſe*, an ancient cuſtom in the city of Exeter, when the lord of the fee cannot be answered rent due to him out of his tenement, and no diſtreſs can be levied for the ſame. The lord is then to come to the tenement, and there take a ſtone, or ſome other dead thing, off the tenement, and bring it before the mayor and bailiff, and thus he muſt do ſeven quarter-days ſucceſſively, and if on the ſeventh quarter-day the lord is not ſatisfied his rent and arrears, then the tenement ſhall be adjudged to the lord to hold the ſame a year and a day; and forthwith proclamation is to be made in the court, that if any man claims any title to the ſaid tenement, he muſt appear within the year and day next following, and ſatisfy the lord of the ſaid rent and arrears: but if no appearance be made, and the rent not paid, the lord comes again to the court, and prays that, according to the cuſtom, the ſaid tenement be adjudged to him in his demefne as of fee, which is done accordingly, ſo that the lord hath from thenceforth the ſaid tenement, with the appurtenances, to him and his heirs.

SHORT-JOINTED, in the *Manege*. A horſe is ſaid to be ſhort-jointed, that has a ſhort paſtern; when this joint, or the paſtern, is too ſhort, the horſe is ſubject to have his fore-legs from the knee to the cornea all in a ſtraight line. Commonly ſhort-jointed horſes do not manege ſo well as the long-jointed; but out of the manege, the ſhort-jointed are the beſt for labour or fatigue, eſpecially thoſe of the farm breed.

SHORT-SIGHTEDNESS, *MYOPIA*, a defect in the conformation of the eye, wherein the cryſtalline, &c. being too convex, the rays reflected from different objects are refracted too much, and made to converge too faſt, ſo as to unite before they reach the retina, by which means viſion is rendered dim and confuſed. See *MYOPS*.

A learned author thinks it probable, that out of ſo great a number of ſhort-ſighted perſons as are daily to be met with, few are born ſo, for it generally grows upon young people at the age of twenty or twenty-five, and therefore might poſſibly be prevented by uſing their eyes, while young, to all ſorts of conformations, that is, by often looking through glaſſes of all ſorts of figures, and by reading, writing, or working with ſpectacles of ſeveral degrees of convexity; for whatever be the powers by which the eye conforms itſelf to diſtinct viſion, they may poſſibly grow weak, or loſe their extent one way or other, for want of variety of exerciſe. It ſeems an opinion without foundation, to think that ſuch an exerciſe of the eyes can anywiſe injure them, provided due care be taken to avoid looking at objects that are too bright.

Short-ſightedneſs may come by accident; of this we have a remarkable inſtance, mentioned by Dr. Briggs in his *Ophthalmographia*, of a perſon upwards of ſeventy years old, who had uſed ſpectacles for ten years, and yet by catching cold, he ſuddenly became ſo ſhort-ſighted, that he could not diſtinguiſh objects three feet off, and after the cold and deſluxion were cured, he continued to read the ſmalleſt print without ſpectacles for many years.

Dr. Smith mentions a young gentleman, who became ſhort-ſighted immediately after coming out of a cold bath, in which he did not totally immerſe himſelf, and has ever ſince uſed a concave glaſs for many years.

It is commonly thought that ſhort-ſightedneſs wears off in old age, on account of the eye becoming flatter: but the learned doctor queſtions whether this be matter of fact, or hypotheſis only.

It is remarkable, that ſhort-ſighted perſons commonly write a ſmall hand, and love a ſmall print, becauſe they can ſee more of it at a view. That it is cuſtomary with them

not to look at the perſon they converſe with, becauſe they cannot well ſee the motion of his eyes and features, and are therefore attentive to his words only. That they ſee more diſtinctly, and ſomewhat farther off, by a ſtrong light than by a weak one; becauſe a ſtrong light cauſes a contraction of the pupil, and conſequently of the pencils, both here and at the retina, which leſſens their mixture, and conſequently the apparent confuſion; and, therefore, to ſee more diſtinctly, they almoſt cloſe their eye-lids, for which reaſon they were anciently called *myopes*. Smith's Optics, vol. ii. Rem. p. 10. &c.

Dr. Jurin obſerves, that perſons who are much and long accuſtomed to view objects at ſmall diſtances, as ſtudents in general, watch-makers, gravers, painters in miniature, &c. ſee better at ſmall diſtances, and not ſo well at great diſtances, as the reſt of mankind. The reaſon is, that in the eye, as well as in other parts, the muſcles, by conſtant exerciſe, are enabled to contract themſelves with more ſtrength, and by diſuſe are brought to leſs ſtrength. Hence, in the perſons before-mentioned, the greater muſcular ring of the uvea contracts more eaſily and ſtrongly, and the cornea more readily obeys the contraction of the ring, whence they ſee better at ſmall diſtances. And the cornea, by being thus often and long bent into a greater convexity, does by degrees loſe ſomething of its elaſticity, ſo as not to return to its natural elaſticity, when the muſcular ring ceases to act upon it. This is one cauſe of their not ſeeing ſo well at great diſtances: alſo the ligamentum ciliare, being ſeldom employed to leſſen the convexity of the capſula, does by degrees become leſs capable of performing that office: and the capſula being ſeldom drawn out, and put into tenſion, muſt loſe ſomething of its diſtenſile quality, ſo as leſs eaſily to comply with the action of the ligament. And this is another cauſe of their not ſeeing ſo well at great diſtances. Jurin, Eſſay on diſt. and indiſt. Viſion.

The ordinary remedy for ſhort-ſightedneſs is a concave lens, held before the eye, which making the rays diverge, or at leaſt diminiſhing much of their convergency, makes amends for the too great convexity of the cryſtalline.

Dr. Hook ſuggeſts another remedy. Finding that many ſhort-ſighted perſons are but little helped by concaves, he recommends a convex glaſs, placed between the object and the eye, by means of which the object may be made to appear at any diſtance from the eye: and conſequently, all objects may be thereby made to appear at any diſtance from the eye, ſo that the ſhort-ſighted eye ſhall contemplate the picture of the object in the ſame manner as if the object itſelf were in the place. It is true, the image will appear inverted, but we have expedients to remedy this too; for, in reading, there needs nothing but to hold the book upſide down. To write, the beſt way, in this caſe, will be, for the perſon to learn to do it upſide down. For diſtant objects, the doctor aſſerts, from his own experience, that with a little practice in contemplating inverted objects, one gets as good an idea of them as if ſeen in their natural poſture.

SHOSTACK, in *Commerce*, a money of account in Poland and Hungary. In Hungary, a ſhoſtack is 2 imperial groſchen, or 6 creutzers; an imperial groſche, or kayſer groſche, is 2 polturats, 3 creutzers, or 12 pfenings; a polturat is 6 pfenings, and a creutzer 4 pfenings. A Hungarian groſche is worth 2 creutzers in Upper Hungary, but 2½ creutzers in Lower Hungary: thus, 5 groſchen in Upper Hungary, or 6 groſchen in Lower Hungary, = 1 kayſer groſche. A rixdollar of account is worth 1½ imperial florin, 1½ Hungarian florin, 15 ſhoſtacks, 30 imperial groſchen, or 90 creutzers. An imperial florin is 10 ſhoſtacks, or 20 imperial groſchen, and a Hungarian florin, 8¼ ſhoſ-

8 $\frac{1}{2}$ shostacks, or 17 $\frac{1}{2}$ imperial groschen ; thus, 7 florins of the empire = 8 Hungarian florins.

In Poland, the florin of 30 groschen or grosz, each of which is divided into 18 pfenings, contains 2 $\frac{1}{2}$ shostacks, 90 shillings, or 270 pfenings. A shostack is worth 12 groschen, or 36 schillings ; a grosche, 2 schillings ; a schilling, 3 pfenings. Kelly's Cambist.

SHOT, INDIAN, in *Botany*. See CANNA.

SHOT, in the *Military Art*, includes all forts of ball or bullets for fire-arms, from the cannon to the pistol. See BULLET, CANNON, &c.

Those for cannon are of iron ; those for muskets and pistols are of lead.

SHOT, for ordnance, especially in the sea service, are of several sorts : as,

SHOT, *Round*, balls or globes of iron fitted to the bore of the piece.

SHOT, *Bar*, is formed of two bullets, or rather half bullets, joined together by an iron bar, serving to cut down masts, sails, &c.

SHOT, *Cafe*, *Chain*, *Grape*, *Langrel*, *Random*, *Star*, and *Trundle*, see the respective articles. See also FIRE-ARMS.

SHOT, for fowling, is otherwise called *bail*, by reason of its figure and size.

The method of casting it is as follows : the lead being melted, stirred, and skimmed, a quantity of powdered yellow orpiment is strewed in it, as much as will lie on a shilling, to twelve or fifteen pounds of lead ; the whole being well stirred, the orpiment will flame.

To judge whether there be orpiment enough in, a little of the lead is dropped into a glass of water, and if the drops prove round, and without tails, there is orpiment enough, and the degree of heat is as it should be.

This done, a copper plate, hollow in the middle, and three inches in diameter, bored through with thirty or forty small holes, according to the size of the shot, is placed on an iron frame, over a tub of water, four inches above the water ; the hollow part is to be very thin ; on this plate are laid burning coals, to keep the melted lead in fusion. The lead is now poured gently, with a ladle, on the middle of the plate, and it will make its way through the holes in the bottom of the plate into the water in round drops.

Great care is taken to keep the lead on the plate in its proper degree of heat : if too cold, it will stop the holes ; and if too hot, the drops will crack and fly.

The shot, thus made, are dried over a gentle fire, always stirring them that they do not melt ; this done, the greater are separated from the smaller by passing them through sieves for that purpose.

SHOT, *Fresh*. See FRESH Shot.

SHOT, *Hip*. See HIP Shot.

SHOT, *Water*. See WATER Shot.

SHOT of a Cable, on *Ship-board*, is the splicing of two cables together, that a ship may ride safe in deep waters and in great roads, for a ship will ride easier by one shot of a cable, than by three short cables out a-head.

SHOT-FLAGON, a sort of flagon somewhat bigger than ordinary, which, in some counties, particularly Derbyshire, it is the custom for the host to serve his guests in, after they have drank above a shilling.

SHOTS, in *Agriculture*, a term provincially applied to young store-swine.

SHOTT, in *Geography*, a town of Egypt ; 3 miles S. of Siut.

SHOTT, a large valley or plain of Africa, in the country

of Sahara, on the borders of Algiers ; 50 miles in length, and about 12 in breadth. The word commonly signifies the sea-shore, or the banks of some lake or river ; but the meaning here is somewhat varied, and denotes the borders or area rather of such a plain, as, according to the seasons of the year, is either covered with salt, or overflowed with water. Several parts of the Shott consist of a light oozy soil, which, after sudden rains, or the overflowings of the adjacent rivers, are changed into so many quicksands, and occasion no small danger to the unwary traveller. La Croix was badly informed, in affirming that all the rivers of this kingdom run from south to north : since, besides several others in a quite contrary direction, we have no fewer than five, and those very considerable streams, which empty themselves from the northward into the Shott ; 100 miles S.W. of Constantina.

SHOTTEN HERRINGS. See HERRING.

SHOTTEN, *Blood*. See BLOOD-Shotten.

SHOTTSWOOD, in *Geography*, a town of America, in New Jersey, on the Rariton ; 4 miles E. of Brunswick.

SHOVEL, Sir CLOUDESLEY, in *Biography*, a British naval hero, was born about the year 1650, of parents in rather humble circumstances, but who having expectations from a relation, whose name was Cloudesley, they thought fit to bestow that name on their son, as a probable means of recommending him to his relation's notice. Nevertheless, being perhaps disappointed in their plans, they put out their son apprentice to a shoe-maker, to which business he applied some years, when he betook himself to the sea, under the protection of sir John Narborough, with whom he went out in no higher capacity than that of cabin-boy. He soon, by talents and steady application to the art of navigation, became an able seaman, and obtained preferment, through the favour of sir Christopher Myngs. After the close of what is called, in history, the second Dutch war, Shovel went out with sir John Narborough, who was deputed to check the piratical state of Tripoli. In the spring of 1674 sir John arrived before Tripoli, and being ordered to try negotiation rather than force, he sent Shovel with a message to the Dey, desiring reparation for the evils already sustained, and security for the time to come. The Dey, despising his youth, treated him with disrespect, and sent him back with an equivocal answer. Mr. Shovel, on his return, proved that he had not been an unobservant spectator on shore ; and the admiral, pleased with his remarks, sent him again with a second message. He was treated with more rudeness than before, which he bore with apparent submission, and made use of it as an excuse for remaining longer on shore ; and on his return he assured the admiral, that it was very practicable to burn all the ships in the harbour. Sir John immediately appointed him to the enterprise, which he executed with the most complete success. The account which the admiral sent home respecting the conduct of this young man was so honourable to his talents and courage, that in the course of a few months he had the command of the *Sapphire*, a fifth-rate, given him ; and soon after was raised still higher in the service, by being appointed to the *James Galley*, a fourth-rate, in which he continued to the death of king Charles II., by whom he had been raised.

By James II. captain Shovel was preferred to the command of the *Dover*, a fourth-rate, in which he was at the time of the revolution. This event was fortunate for captain Shovel, as well as very agreeable to his way of thinking ; for being in almost every engagement during the reign of William, he became conspicuous, and made his rise in the service as quick as it was possible to be effected. He was in the battle of Bantry-Bay, in the *Edgar*, a third-rate, and

gave such signal marks of courage and conduct, that when the king came to Portsmouth, he was pleased, on the recommendation of admiral Herbert, who for that action was raised to the dignity of earl of Torrington, to confer on him the honour of knighthood; a title which was, by being more select, of much more worth than it now is. In June, 1690, sir Cloudefley Shovel was employed in conveying the king and his army into Ireland. William, for his good conduct on this occasion, appointed him rear-admiral of the blue, and delivered to him the commission with his own hands.

In the following year sir Cloudefley Shovel attended the king to Holland; and in 1692 he was declared admiral of the red, and again accompanied his majesty to Holland; and on his return he joined admiral Russel with the grand fleet, and had a large share in the danger and glory of the celebrated battle of La Hogue. When it was thought requisite that the fleet should be put under command of joint admirals in the succeeding year, he was one; and, says the judicious and cautious Campbell, "if there had been nothing more than this joint commission, we might well enough account from thence for the misfortunes which happened in our affairs at sea, during the year 1693." The joint admirals were of different parties; but as they were all good seamen, and probably meant well to their country, though they did not agree in the manner of serving it, it is most likely "that, upon mature consideration of the posture things were then in, the order they had received from court, and the condition of the fleet, which was not either half manned or half victualled, the admirals might agree that a cautious execution of the instructions which they had received was a method as safe for the nation, and more so for themselves, than any other they could take." On this occasion sir Cloudefley Shovel was at first an object of popular odium; but when the affair came to be strictly investigated in parliament, he gave so clear and satisfactory an account of the matter, that it satisfied the people that the commanders were not to blame; and that if there was treachery, it must have originated in persons in office at home. The character of sir Cloudefley remaining unimpeached, we find him again at sea, in 1694, under lord Berkley, in the expedition to Camaret-bay, in which he distinguished himself by his dextrous embarkation of the land forces, when they failed on that unfortunate expedition; as also when, on their return to England, it was deemed necessary to send the fleet again upon the coast of France, to bombard Dieppe, and other places. From this time till 1702, Shovel was not engaged in any expedition of moment, when he was sent to Vigo, after the capture of that place by sir George Rooke, to bring home the spoils of the Spanish and French fleet. He arrived on the 16th of October, and carried off whatever could possibly be brought home, burnt the rest, and arrived safely in the Downs on the 7th of November; which was considered as so remarkable a service by the court, that, though he was no favourite at court, it was resolved to employ him in affairs of the greatest consequence; and he so effectually crushed the power of the French at sea, that they did not afterwards dare to meet the British fleet; and on account of the great share which he had in the victory obtained the 13th of August 1704, he was appointed rear-admiral of the fleet of England in the January following. He performed many other acts, which were useful to his country, and important to the cause in which it was then engaged. His last act was the defence of the coasts of Italy, of which, when he had taken due care, he left a sufficient force at Gibraltar for the purpose, and set sail with ten ships of the line, five frigates, four fire-ships, a sloop,

and a yacht, for England. On the 22d of October, 1707, he came to foundings, and in the following morning he had ninety fathom water. About noon he lay by, but at six in the evening he made sail again, and stood away under courses, believing that he saw the light on St. Agnes, one of the islands of Scilly. Soon after this several of his ships made signal of distress, as he himself did. It was with difficulty that sir George Byng, in the Royal Anne, saved himself, having one of the rocks under her main chains. Several others run the most imminent risks; but the admiral's ship, and some more, perished with all aboard. How this accident happened has never been properly accounted for. The body of sir Cloudefley Shovel was thrown ashore the next day upon the island of Scilly, where, falling into the hands of some fishermen, he was stripped and buried. Among their plunder was an emerald ring of great value, which, being shewn about, made a great noise all over the island, and led to the discovery of the body. This was now taken up, and conveyed to London, when it was interred with great solemnity in Westminster Abbey. To his memory an expensive monument of white marble was erected, by direction of her majesty, on which was the following inscription: "Sir Cloudefley Shovel, knt., rear-admiral of Great Britain, admiral and commander-in-chief of the fleet; the just rewards of long and faithful services, he was deservedly beloved of his country, and esteemed, though dreaded, by the enemy, who had often experienced his conduct and courage. Being shipwrecked on the coasts of Scilly, in his voyage from Toulon, on the 22d of October 1707, at night, in the 57th year of his age. His fate was lamented by all, but especially the sea-faring part of the nation, to whom he was a very worthy example. His body was flung on the shore, and buried with others in the sands; but being soon after taken up, was placed under this monument, which his royal mistress has caused to be erected, to commemorate steady loyalty and extraordinary virtues." See Stockdale's edition of Campbell's Lives of the Admirals.

SHOVEL, in *Agriculture*, a well-known implement, consisting of a long handle, and a broad blade, with raised edges.

SHOVEL, *Castling*, a tool somewhat of the wooden shovel kind, which is sometimes employed in cleaning or dressing corn. It is very useful in this mode, where the wind is trusted to for managing the business.

SHOVEL, *Draining*, a sort of tool of this nature, frequently employed for the purpose of clearing out the loose crumbly earthy materials from the bottom parts of drains. It is formed with a crooked handle, the edges of the shovel part being turned up on the sides, in order to prevent the materials which are scraped up from falling off. In consequence of the crookedness of the handle, the workman is prevented from stooping so much as would otherwise be the case, in performing the work. There are different constructions of this implement made use of, in managing business of this sort.

A scoop is likewise sometimes made use of, both with and without this implement, for the purpose of scooping up and clearing out all the crumbs, loose mould, and other similar materials, from the bottom parts of drains, before they are laid or filled with spray, brush-wood, or any other substance, in order that they may be quite clear and free of any sort of obstruction. The tool is formed in a crooked scoop-like manner at the head, and of different shapes, sizes, and breadths, according to the nature of the drains and openings in which it is to be employed; being, in working, drawn or pushed along the bottoms of the cuts or drains.

The

The handle has also occasionally a crooked form, in order to ease the workman in using it.

SHOVEL, Paring, that sort of tool of this kind, which is employed in some places for paring off the sward or turf from the surface of ground, in order to burn it. The shovel which is used in Devonshire for this purpose has a hollow heart-shaped form in the shovel part, with a long handle, which makes it a very powerful implement. The plate of the mouth part is from nine to ten inches in width, where the handle is inserted, which is made with a considerable curve upwards; the blade is about twelve inches in length, terminating with a broad angular point, which, with its sides, are constantly kept very sharp and keen for cutting; on the left hand, or land side of the tool, a sharp wing, comb, or coulter, rises up in an oblique manner, to cut and divide the slice part from the whole ground. This, however, in consequence of the toughness of the surface, and the impediments presented by the roots of furze, flags, heather, and other similar matters, is not unfrequently dispensed with; the slice being rent or torn off by the workman from the side of the whole ground, while it is cut up and separated from the earth below. When a foot or fifteen inches of the slice rises upon the handle of the shovel, it is separated from the uncut part of the surface by a sudden effort or exertion with the tool, and by a turn of it is whelmed or laid over the mould side upwards. Where the state and circumstances of the surface will permit, as by not being too much loaded and encumbered with the above sorts of plants, the effort of separating the cut from the uncut sward may in all cases be much lessened, by having the slice, which is next to be pared, cut or nicked in such lengths as may be most convenient to the workmen. And in some particular places and situations of land, the regular nicking of the slice to be pared from the ground is indeed found indispensable necessary, as where the ground is of such a moory quality as to render the operation impracticable without it. In all such instances it is, however, probably much better, as being more convenient and expeditious, to have the shovel formed with a cutting wing, by which the whole may be done at once, without any sort of delay in the business. This sort of shovel may be seen at *fig. 9*, in the plate of paring ploughs.

SHOVEL, Spit, an useful tool for some small purposes. It is that sort which is often employed in setting small roots or plants, as those of the cultivated saffron, and some others of a similar nature.

SHOVELER, in *Ornithology*. See *Broad-beaked Duck*.

SHOVELING, in *Agriculture*, a term used in Ireland to signify the throwing the mould of furrows, in cleaning them out, over the ridges.

SHOULDER, HUMERUS, in *Anatomy*. See *EXTREMITIES*.

SHOULDER, Fracture of, in *Surgery*. See *FRACTURE*.

SHOULDER, Luxation of. See *LUXATION*.

SHOULDER-Blade, in *Anatomy*, a bone of the shoulder, of a triangular form, covering the hind part of the ribs, called by anatomists the *scapula* and *omoplatea*. See *EXTREMITIES*.

SHOULDER-Bone. See *EXTREMITIES*.

SHOULDER, in the *Manege*, is the joint of a horse's fore-quarters, that joins the end of the shoulder-blade with the extremity of the fore-thigh.

SHOULDER of a Branch, is that part of it which begins at the lower part of the arch of the banquet, over-against the middle of the fonceau or chaperon, and forms another arch under the banquet. The shoulder of a branch calls a

greater or lesser circumference, according as it is designed to fortify or weaken the branch. See *BRIDLE, BANQUET*, and *BRANCHES*.

SHOULDER-Pegged Horses, called in French *chevillées*, are such as have their shoulders gourd, stiff, and almost without motion. A horse charged with shoulders, is one that has thick, fleshy, and heavy shoulders.

SHOULDER of a Bastion, in *Fortification*, is where the face and the flank meet.

SHOULDER-Drain, in *Agriculture*, a sort of under drain, constructed with a shoulder on each side of the cut or opening, so that some sort of strong substance may be laid over it, and form an opening or drain for the water below. See *DRAIN*.

SHOULDER, in *Block-Making*, a projection made upon the surface of blocks, pins, &c. by reducing one part to a less substance.

SHOULDER-Block, a large single block, left nearly square at the lower end, or arse of the block, and cut sloping in the direction of the sheave. Shoulder-blocks are used on the lower yard-arms, to lead in the top-sail-sheets, and on the top-sail-yards, to lead in the top-gallant-sheets; and by means of the shoulder they are kept upright, and prevent the sheets jamming between the block and the yard: they are also used at the lower outer end of the boomkins, to lead in the fore-tacks.

SHOULDER-of-Mutton Sail, a triangular sail, similar to the latten sail; but attached to a mast instead of a yard.

SHOULDERING, in *Fortification*. See *EPAULEMENT*.

SHOULDERING-PIECE, in *Building*. See *BRACKET*.

SHOULDER-KNOTS. See *EPAULETTES*.

SHOULDER-PITCHT, in *Farriery*, is a disease in a horse, when the pitch or point of the shoulder is displaced, which makes the horse halt downright.

SHOULDER-SPLAIT, or **SHOULDER-TORN**, is a hurt which befalls a horse by some dangerous slip, by which the shoulder is parted from the breast.

SHOULDER-WRENCH, is a strain in the shoulder.

SHOUT, CLAMOR, in *Antiquity*, was frequently used on ecclesiastical, civil, and military occasions, as a sign of approbation, and sometimes of indignation. Thus as Cicero, in an assembly of the people, was exposing the arrogance of L. Antony, who had had the impudence to cause himself to be inscribed the patron of the Romans, the people, on hearing this, raised a shout to shew their indignation.

In the ancient military discipline shouts were used, 1. upon occasion of the general's making a speech, or harangue, to the army from his tribunal: this they did in token of their approving what had been proposed. 2. Before an engagement, in order to encourage and spirit their own men, and fill the enemy with dread.

This is a practice of great antiquity, besides which, it wants not the authority of reason to support it, for as mankind are endowed with two senses, hearing and seeing, by which fear is raised in the mind, it may be proper to make use of the ear as well as the eye for that purpose.

Shouts were also raised in the ancient theatre, when what was acted pleased the spectators. See *ACCLAMATION*.

It was usual for those present at the burning of the dead to raise a great shout, and call the dead person by his name before they set fire to the pile. See *BURIAL*.

SHOWEL,

SHOWEL, in *Agriculture*, a term applied to a blind for a cow's eyes.

SHOWER, a cloud resolved into rain, and discharged on a certain tract of ground.

In *Natural History* we meet with abundance of instances of extraordinary and preternatural showers; as *showers of blood*, mentioned by Gassendus and others; a *brimstone shower*, mentioned by Wormius; *showers of frogs*, mentioned by Pliny, and even by Dr. Plott; a *shower of millet-seed* in Silesia, mentioned in the Ephem. German.; *showers of ashes*, frequent in the Archipelago; a *shower of wheat*, in Wiltshire; a *shower of whittings*, mentioned in Philosoph. Transact. The natural reasons of many of which may be seen under RAIN.

SHOOWOR, in *Geography*, a town of Hindoostan, in Myfore, where, in 1790, a bloody battle was fought between the British and Tippoo, and in which the latter was defeated; 15 miles S. of Sattimungulam.

SHOWS, or **SHAWS**, in *Agriculture*, a term applied to the haulm or tops of potatoes. See POTATOE and SOLENUM.

SHRAHEEN, in *Geography*, a mountain of Ireland, in the county of Mayo; 11 miles N.N.E. of Castlebar.

SHRAVEY LAND, in *Agriculture*, a term used in some districts, as those of Suffex, and some others, to signify that of a strong, gravelly, or stinty nature. The scars or holes on the sides of steep hills, where the turf or sward has slipped away, and laid bare the soil on the South Down, are sometimes called shraives. See SOIL.

SHREW, or **SHREW-Mouse**, in *Zoology*, the common name of the creature called by authors *Mus araneus*, and *Sorex araneus* of Linnæus. It is an animal of a mixed brown and reddish tawny colour: the belly is white; its tail is about one inch and a half long, and covered with short hairs; its body is about two inches and a half in length; and its eyes black and very small; they are indeed little larger than those of the mole, and do not exceed the size of the head of the smallest pin; it is no wonder, therefore, that the creature is almost blind; the nose long and slender; the ears short and rounded: the teeth are very small, and differ in their shape and situation from those of all other creatures in the world; and seem as if nature had in one creature made a sort of mixture of the teeth of the mouse and the snake kind.

It has two long fore-teeth, as all the mouse kind have: but these are not single, as in mice, but have two or three other small and sharp teeth growing out of them: these, to an accurate observer, might either be wholly unseen, or taken for distinct teeth; and the anterior long teeth are not separated from the rest by any gap or space, as in the mouse kind, but make one continued series with the others. The upper jaw in this creature is longer than the under, and the teeth are sharp and ferrated, some with two, some with three points, and these so small, that they might easily not be seen, but that the tips of them are reddish. Their whole number is twenty-eight.

It is very common in many parts of the world, and is met with in almost all our dry grounds, in old walls and holes in the earth; near hay-ricks, dung-hills, and necessary houses; it lives on corn, insects, and any filth; the cats will kill it, but never attempt to eat it. It brings four or five young at a time.

Its whole body has a fetid and offensive smell. The ancients erroneously believed it was injurious to the cattle. There seems to be an annual mortality of these animals in the month of August, numbers being then found dead in the paths.

It is distinguished at first sight from the common mouse, in that it is smaller; its nose longer, and like a hog's; it has five toes on the hinder as well as the fore-feet; its eyes are extremely small; its ears very short; its claws are long and whitish, and its feet short. Ray and Pennant.

SHREW-Mouse, *Water*, *Sorex fodiens* of Pallas, is much larger than the common shrew; its length from nose to tail being $3\frac{3}{4}$ inches; its tail two inches; the upper part of the body and the head are of a black colour; the throat, breast, and belly, of a light ash-colour; and beneath the tail there is a triangular dusky spot.

This animal inhabits Europe and Siberia; was lost in England till the year 1768, when it was discovered in the Lincolnshire fens; it burrows in the banks near the water, and is said to swim under water; it is called in some places the *blind mouse*, on account of the smallness of its eyes; and it chirrup like a grasshopper. Pennant.

SHREWSBURY, in *Geography*, an ancient borough and market-town in the hundred of the same name, and county of Salop, or Shropshire, England, is situated on two hills, peninsulated by the river Severn, at the distance of 112 miles from Bath, and 162 miles from London. It is the chief town, or capital, of the county, and, from its historical importance, is particularly deserving of an extended description, even in a work like the present. According to the parliamentary returns of 1811, it is divided into the six parishes of St. Giles and Holy Cross, St. Chad, St. Mary, St. Julian, St. Alkmund, and Meole-Brace, which united, contain 3229 houses, and 16,606 inhabitants. It must be remarked, however, that some of these parishes extend a short way into the country. The liberties of Shrewsbury comprise six other parishes, four townships, and two chapels.

Origin and Historical Events.—Although no doubt can be entertained of the high antiquity of Shrewsbury, it being frequently mentioned by our earliest historians, there is no authentic record of its origin. Probable conjecture, however, has assigned that event to the fifth century, when the Britons were forced by the Saxons to abandon all the country to the eastward of the river Severn. It is supposed that, after the destruction of the Roman Uriconium, the fortifications of which enabled the possessors for a time to check the progress of their enemies, that they established themselves on the site of Shrewsbury, on account of the natural security afforded by its lofty and peninsular position. At that period this spot was called the Pengwerne hill, whence the town received the appellation of Pengwerne, to which Powis was subsequently added, when it had become the capital of Powisland, and the seat of its princes, whose palace occupied the same ground with the old church of St. Chad. Here the Britons maintained themselves for several centuries, notwithstanding the repeated efforts of the Mercian Saxons to dispossess them; but at length the arms of the warlike Offa proved too powerful for further resistance, and they were compelled to retire to Mathrafael, among the mountains of Montgomeryshire, where they preserved their ancient dignity and independence, till finally subdued by Edward I. of England.

The Saxons, having obtained possession of this ancient capital, changed its name from Pengwerne to Scrobbsbyrig, or Scrobbsbyri, which words have nearly the same signification, *viz.* "the head of the alder groves." Instead of levelling it with the ground, as was their custom when they seized upon any British town, they seem to have protected it with care, and probably even increased its opulence and extent. In the reign of Alfred it was numbered among the principal cities in his dominions: and in that of Edward the

SHREWSBURY.

Elder it had the privilege of a mint. In 1006, king Ethelred kept his Christmas here; but in about ten years thereafter, the inhabitants having declared against that prince in favour of his rival Canute the Dane, his son, prince Edmund, afterwards king Edmund Ironside, attacked and took the town after a short siege. On this occasion Shrewsbury seems to have suffered greatly; as in the reign of Edward the Confessor, its houses only amounted to 252 in number. Posterior to the Conquest, it was bestowed upon Roger de Montgomery, who was created earl of Shrewsbury, Arundel, and Chichester; and appears from Domesday book to have then paid 20*l.* in taxes to the king and sheriff. Earl Roger, on acquiring possession of this city, (for so it was styled in his time,) fixed his residence in it, and founded both a castle and an abbey. He did not, however, long possess them undisturbed, for in 1067, Owen Gwynedd, prince of Wales, assailed it with so formidable a force, that the conqueror deemed it advisable to repel the invasion in person. He accordingly marched hither from York, raised the siege, and overthrew the Welsh with prodigious slaughter. Shrewsbury was again besieged in the reign of Henry I., in consequence of its then possessor, Robert, son to earl Roger, having united his forces to those of the rebellious barons; and it was probably only saved from the horrors of an assault by the submission of the earl, who was banished to Normandy, and had all his immense estates forfeited to the crown.

Shrewsbury being esteemed the most important town and fortress on the marches of Wales, continued, during several centuries, to be one of the principal places of rendezvous for the English armies, and hence was often visited by its monarchs. Numerous conflicts took place in its immediate vicinity, and its inhabitants frequently suffered the evils incident to sieges. During the wars between Stephen and the empress Maud for the succession to the crown, William Fitz-Alan, a powerful baron, then governor of Shrewsbury castle, supported the claims of the latter. Stephen, however, early obtained possession of it, and ungenerously put to death many of the brave knights by whom it was defended. Fitz-Alan fled to the continent, where he remained an exile till the accession of Henry II., who restored him to all his honours and possessions. In the reign of king John, the royal council assembled here to consider of the best means of checking the incursions of the Welsh; when the prince of Powis came, and frankly offered terms of accommodation: but to the disgrace of the English lords, instead of receiving him with respect, they threw him into prison. Soon afterwards, however, he was released, and a treaty with the Welsh was concluded, for the performance of which twenty-nine children were delivered as hostages, all of whom were most inhumanly hanged by king John, in consequence of some infringement of its terms by the prince of Wales. But this barbarous massacre did not long remain unpunished; for in 1215, the Welsh having dispersed all the armies of the lords marchers, suddenly appeared before Shrewsbury, which submitted without resistance. How long the Welsh held their conquest, or how they lost it, is uncertain; but in 1221 Shrewsbury had again passed into the possession of the English. In the seventeenth year of Henry III. it was plundered and burnt by the earl of Pembroke and other factious barons, who had joined their arms to those of prince Llewellyn. The rebel Simon de Montfort, earl of Leicester, likewise seized upon this town; but it soon reverted to the king: and in 1267, Henry assembled a large army here, with the design of crushing the Welsh power, but the interference of the pope prevented the execution of his views. Edward I., who, during his father's life-time, had

been invested with the government of Shrewsbury, made it, in 1277, the principal seat of his court, and removed hither the courts of exchequer and king's bench, that he might the more easily accomplish his favourite object, the subjugation of Wales.

During the rebellion which the infatuated attachment of Edward II. to the Spencer family gave rise to, the king was received at Shrewsbury with great military parade, and a tournament was held here, attended by the knights and soldiers of the marches. Afterwards, when Edward was deprived of his liberty and throne by his queen, and her paramour, Roger Mortimer; Edmund Fitz-Alan, earl of Arundel, who had been faithful to his allegiance, was seized by the inhabitants, and put to death; for which service Mortimer, in the name of the king, granted to the burgesses of Shrewsbury, whom he calls "the good men of Salop," all the goods and chattels found upon the earl. Richard II. held a parliament here in the 20th year of his reign, on which occasion he gave a sumptuous feast to the members in the abbey of St. Peter and St. Paul. The next event of importance which occurred at this town was the famous battle of Shrewsbury, in which Henry V., then prince of Wales, first distinguished himself in the field, and the gallant Hotspur fell, after performing, in conjunction with his rival Douglas, the most brilliant acts of prowess.

Throughout the whole of that eventful period, marked by the contentions of the rival houses of York and Lancaster, the inhabitants of Shrewsbury steadily adhered to the interests of the former. The learned author of the "Account of the ancient and present State of Shrewsbury," contends that it was here, and not at Salisbury, as commonly supposed, that Henry Stafford, duke of Buckingham, was executed by order of Richard III., who was chiefly indebted to him for his usurped crown. When Henry VII. landed in Wales, he marched directly towards Shrewsbury, where he was received "with raptures of joy" by all except the "head bailey," who for a time refused him admittance. Here he was first proclaimed king of England, and here he collected and organized the greater part of those forces with which he achieved the signal and decisive victory of Bosworth Field. In consequence of these circumstances, Shrewsbury was greatly favoured by that monarch, and was frequently visited by him during his reign.

From this period till the reign of Charles I. no event of historical importance happened here. When the parliamentary war broke out, however, the king came hither, and was cordially welcomed by the inhabitants, though they had been strongly prejudiced against him by the commissioners for the parliament. The greater part of the army with which he first took the field was composed of persons resident in this town and the adjoining counties. After the king left Shrewsbury, it was garrisoned in his cause; but the bad health of the governor having prevented him from enforcing the discipline of the soldiery with sufficient vigour, they became negligent and debauched. The parliamentary officers, colonels Mitton and Bowyer, being informed of the state of the garrison, made several attempts to surprize the town, and at length succeeded in their object, in February 1645. By this event the parliament gained the important advantage of cutting off the king's communication with North Wales, and a formidable association, which was on the point of being formed between the loyal inhabitants of the counties of Salop, Worcester, Chester, and Flint, was destroyed in the bud.

In Cromwell's life-time, and also immediately after his death, two attempts were made to gain possession of Shrewsbury in favour of Charles II.; but both of them were frustrated. The last circumstance which history records worthy of notice, occurred

SHREWSBURY.

occurred in August 1687, when James II. held his court here. On this occasion, the "sentiments of loyal attachment, for which Shrewsbury has ever been conspicuous, burst forth with chivalrous enthusiasm."

General Appearance of the Town.—Shrewsbury, from its lofty and peninsular situation, presents, at every approach, a pleasing variety of views; "and the noble sweep of the river, which seems to embrace it, heightens at every turn the charms of the scene." Except on the north and west sides, where the streets approach close to its banks, a narrow margin of meadow, or of garden ground, interposes between the houses and the river. The exterior circle of the town is lined with an unbroken range of well-built houses, most of which command beautiful views over the adjacent country. On its western side is a public field, called the Quarry, which occupies about twenty acres of ground, and is adorned with avenues of trees. At one extremity of this field are the remains of a rural amphitheatre, where the Augustine friars of the adjoining convent were probably wont to exhibit those ancient sacred dramas called mysteries, or Whitfun plays; which were certainly acted here in the reign of queen Elizabeth.

Such is the exterior aspect of Shrewsbury; but it is to be regretted that its interior appearance is far from corresponding with the external aspect. The streets are ill arranged, and some of them narrow and steep, and but indifferently paved. The houses are extremely mixed in their architectural character, exhibiting a strange contrast of ancient and modern buildings. This circumstance is in part to be attributed to the happy freedom which Shrewsbury has enjoyed, from those general conflagrations which have occasionally devastated other towns within the last two centuries.

Civil Government and Corporation.—Shrewsbury is a corporation, both by charter and prescription. The first charter was granted by Henry I.; but other princes have since altered and extended the privileges it conferred. By the charter now in force, granted by king Charles I., the corporation consists of a mayor, recorder, steward, town-clerk, 24 aldermen, 48 assistants, or common councilmen, two chamberlains, a sword-bearer, serjeants at mace, &c. Four general quarter-sessions are held in the course of the year, and the mayor and some of the aldermen, who are magistrates, hold a court every Tuesday. The chartered companies, besides the general corporations, are sixteen in number, of which those of the drapers and mercers are the most considerable.

Shrewsbury sent members to parliament from their earliest establishment. They are chosen by the inhabiting burgesses, who have been legally assessed to the parish rates. The mayor is the returning officer. The markets are on Wednesday and Saturday, weekly; and there are eight annual fairs.

Public Buildings and Institutions.—The public structures of Shrewsbury are, the castle, the town-hall, the churches, the charitable institutions, the town and county gaol and Bridewell, the market-house and crosses, the theatre, and the bridges.

The *Castle* stands on a narrow neck of land, about five hundred yards in breadth, which is formed by the windings of the Severn. It was founded by Roger de Montgomery, as before mentioned, and became the chief seat of his baronial power. As all the transactions of interest connected with this edifice have been noticed under the head *Historical Events*, &c. it is unnecessary to repeat them. This structure has evidently undergone so many alterations, and is so greatly dilapidated, that it is difficult to form any probable idea of its ancient state. The buildings of it now remaining

consist of the keep, the walls of the inner court, and the great arch of the interior gate-way. The keep, which is converted into a handsome dwelling-house, consists of two round towers of equal size, embattled and pierced, and connected by a square building, about one hundred feet long, and nearly of the same height. The inner court is now a garden, "on a circular grass-plot in which, the newly elected knights of the shire have been girt with their swords by the sheriff, from perhaps the first foundation of our invaluable constitution." The arch of the gateway is clearly part of the original castle. It is eighteen feet high, massive, and semi-circular, and appears to have supported a tower, from which hung the portcullis. On the opposite side of the court is a small postern, probably built in the time of Charles I.; and on its south side is a lofty mount, the summit of which is surrounded by a ruined wall, at one part of which rises a small watch-tower, now a beautiful summer room, much resorted to on account of the fine views which it commands. This castle was defended by ramparts of stone thrown across the peninsula, from the castle to the river, on each side. One of them was formed by Robert de Belesme, and the other by order of Oliver Cromwell. Ramparts and walls with towers likewise defended the town on its northern and eastern sides, but few traces of these remain. The principal gates were three in number, and called the Castle or North-gate, the East or Abbey-gate, and the Welsh-gate, the latter of which stood on the Welsh bridge.

The *Town-hall* is a modern structure, finished in 1786. It was designed by Mr. Haycock, a native of the town, and exhibits a handsome stone front. Here are held all meetings of the corporation, and grand juries, likewise the courts of justice for the town and county. The grand jury room is decorated with portraits of George I. and II., and of admiral Benbow; and another room is appropriated to the reception of a valuable collection of books.

The *established churches* are St. Giles's, St. Chad's, St. Mary's, St. Alkmund, and St. Julian's. St. Giles's is a small plain building, and appears, from some remains of massive square piers, and a semi-circular arch, to have been partly built in the Norman era, and probably on a larger scale than it is at present. Most of the other piers are round, and support pointed arches. St. Chad's church is of modern erection, having been built between 1790 and 1792, in lieu of the old collegiate church, which fell down in the first mentioned year, in consequence of its repair having been too long neglected. It is, "upon the whole, a splendid, and, in many respects, an elegantly ornamented structure." In this church the mayor and corporation are accustomed to sit on festival and other public days. Here are but few monuments, and none of note; but in the church-yard is a chapel, in which many of the tombs and inscriptions rescued from the ruins of the old church are deposited: the principal of them, however, were removed to the respective parish-churches of the families to which they belonged. St. Mary's church was likewise collegiate, and had the privileges of a royal chapel, of which advantages it was deprived in the reign of king Edward VI. It is a venerable pile, in the form of a cross, and comprises a nave, side-aisles, transept, choir, and chapels, with a tower at the west end. Its architecture embraces almost every style prevalent from the Norman conquest to the reign of Henry VIII. The nave is divided from the side-aisles by semi-circular arches; but those separating it from the choir are lofty and pointed. The ceiling here is of oak, and rises in an extremely flat arch, divided by its principal beams into square panels, including circles richly adorned with quatre-foils and foliage; the ribs and bosses being carved into double roses, with devices and knots at their interfection.

terfection. The chancel, choir, &c. display chiefly the pointed style. At the extremity of the former is a spacious window, in the later pointed style, which is nearly filled with stained glass, brought from the ruins of old St. Chad's church. The principal piece represents Jesse in a deep sleep. The spire of this church rises 217 feet above the summit of the tower, upon which it rests. The monuments are numerous, and some of them curious: but we shall only notice one inscription, which is remarkable, from the circumstance of its commemorating a person named Cadman, who was killed in descending from the summit of the spire, by a rope slanting from thence to the opposite side of the river from that on which the church stands. The parish-church of St. Alkmund's, like the two last mentioned, was formerly collegiate, but its college was dissolved as early as the reign of king Stephen. The old church was taken down about the year 1793, and the present building raised in its stead, which is a clumsy imitation of our ancient architecture. St. Julian's church, which closes the list, is a plain substantial edifice, rebuilt in 1750, on account of the ruinous condition of the former edifice.

In addition to the above established churches, there are in Shrewsbury several dissenting places of worship, viz. a Roman Catholic chapel, a Presbyterian meeting-house, also one for Methodists, and another for Quakers.

The *Charitable Institutions* belonging to Shrewsbury are, a small hospital, formerly dedicated to St. Giles, another called Millington's hospital, several alms-houses, an infirmary, a house of industry, and the free and charity-schools. The infirmary is among the earliest provincial institutions of the kind in England, having been opened in 1747. It is supported by voluntary subscriptions, and by benefactions. The house is a plain but respectable building of brick, with a stone portico in front. The house of industry was originally a foundling hospital, connected with that in London, and was only converted to its present purposes in 1784. It is governed by directors chosen from among the inhabitants of Shrewsbury, and maintains, on an average, about 275 poor, including children, partly by a rate levied on the six parishes, and partly by the produce of the labour of the paupers. The free grammar-school was founded and endowed by king Edward VI. at the request of Henry Edwards and Richard Whitaker, and was afterwards augmented by queen Elizabeth, at the instance of Thomas Ashton. The school-house is a large and lofty structure, forming two sides of a square court. The government of this school is vested in the bishop of Lichfield, and the corporation, who appoint two school-masters, one of whom is superior to the other. Several of them have been men of great talents and erudition, and have cherished the seeds of knowledge in many individuals afterwards distinguished in society. Among the latter, were sir Philip Sydney; lord Brook, lord chief justice; lord chief justice Price; Dr. Bowers, bishop of Chichester; Dr. John Thomas, bishop of Salisbury; and the learned Dr. John Taylor. The learned Dr. Butler is the present head master. The other public schools in this town are Bowdler's charity-school, founded in 1724, by Mr. Thomas Bowdler, alderman, for the education and clothing of poor children of St. Julian's parish; Allart's charity-school, founded in 1798, under a bequest by Mr. John Allart, one of the chamberlains of the corporation; and a subscription charity-school, instituted in 1708, for instructing poor children of the town at large.

The *Town and County Gaol and Bridewell*, which now form one building, stands near the castle, where the sheriff probably had his gaol in former times. Its situation is at once beautiful and salubrious, and though it cannot boast much elegance of exterior appearance, it is spacious and

airy, and possesses every convenience requisite for its different purposes. In front is a free-stone arched gateway, containing a bust of Howard, by Bacon.

The *Market-house* is one of the largest and most magnificent buildings of its kind in England. It is of the age of queen Elizabeth, whose arms, sculptured in high relief, decorate the portal, on each side of which is an open arcade, consisting of three large circular arches, supported by columns. The north and south ends of the building are likewise ornamented with large open arches, over one of which stands a statue of Richard, duke of York, removed hither from the Welsh bridge in 1791. Adjoining this building is a conduit, which supplies a great part of the town with water. The *Market-cross* is a strong structure of brick and stone, having a reservoir over it. The old cross was destroyed in 1705. The *Theatre*, according to Phillips, the old historian of the town, is part of the palace formerly belonging to one of the later princes of Powis, but though evidently an ancient structure, it seems improbable that its date should be so remote as such a fact would necessarily imply. It is fitted up in the interior in an appropriate manner.

The *Bridges* over the Severn at this town are called the Welsh bridge, and the English, or East, bridge. Both of them are new structures, erected in place of older ones, which had gone to decay, and were, from their narrowness, unsuitable to the state of commercial advancement Shrewsbury and the county at large now enjoy. The Welsh bridge consists of five elegant arches, about 266 feet in aggregate length, 30 feet high, and 30 broad. Adjoining to it is a quay, faced with stone, and accommodated with warehouses. The English bridge extends 400 feet in length, and consists of seven semi-circular arches, built of fine free-stone. The central arch is 60 feet span and 40 high from the low-water mark; and the two on each side 35 feet wide and 20 high. The breadth between the balustrades is 25 feet; and the ornaments are at once light and graceful.

Monastic Institutions.—The principal monastic establishment in Shrewsbury was the abbey of St. Peter and St. Paul, which stood in the suburb that still bears its name. It was founded, or, as some will have it, re-founded and endowed by Roger de Montgomery, and a nobleman named Warine, who filled it with monks of the Benedictine order. These having subsequently obtained possession of the relics of St. Winefrid, their abbey became the constant resort of various classes of people from all parts of the kingdom, who, according to their circumstances, offered donations on the shrine of the saint. This society, at its dissolution, consisted of an abbot, fourteen monks, and three novices, whose annual revenues, according to Dugdale, amounted to 532*l.* 4*s.* 10*d.* but Speed rates them as high as 656*l.* 4*s.* 3*d.* The remains of the abbey are very inconsiderable, the ground which it occupied being in great part converted into a garden. There is, however, a very curious little structure, which has puzzled the learned in antiquities as to its use: by some it is regarded as a pulpit for preaching. Its plan is an octagon, six feet in diameter, but considerably higher. Over it is an obtuse dome of stone, supported by six narrow pointed arches. The roof within is vaulted on eight ribs, which spring from the side walls, and form a boss at their crossing in the centre, bearing a representation of the crucifixion. The arches on the south side are without ornament, but three of them on the north side are filled with stone panels, adorned with different figures of angels and saints. The abbey church was built in the form of a cross, and was a spacious and magnificent edifice; but at present is in a state of dilapidation, except the western aisle, which is now used as a parish-church, instead of St. Giles's. The other reli-

gious houses here were, a convent of Augustine friars, founded about the year 1256; a second of Franciscan or Grey friars, the date of which is unknown; and a third of Dominicans, founded by lady Geneville in the reign of Henry III. The queen of Edward IV. twice lay in at this monastery. Besides these, there were chapels dedicated respectively to St. Michael, St. Nicholas, St. Catherine, St. Blaise, and St. Mary Magdalen.

Shrewsbury contains several ancient private structures, which would claim notice, did the limits of our article permit of a commensurate extension. One of them, still called the Council-House, was formerly the residence of the court of the marches of Wales, on their annual visits to this town. For some account of this court, see LUDLOW.

The *eminent natives* of Shrewsbury, besides Dr. Thomas and Dr. Taylor, before-mentioned, were Thomas Churchyard, a poet of some note, admiral Benbow, and the Rev. Hugh Farmer, author of several learned and critical works.

The objects in the vicinity of Shrewsbury, most worthy of notice, are the Shelton oak, which is remarkable from a tradition, that Owen Glyndwr ascended it to reconnoitre, previous to the battle of Shrewsbury, and for its great size; Battlefield, where the battle was fought; and Haughmond Abbey, which stands about four miles to the eastward of Shrewsbury. It is situated on a rising ground, which commands beautiful and extensive views, and owed its foundation and endowment to William Fitz-Alan, in the year 1100. The inhabitants were canons regular of St. Augustine, who enjoyed at the dissolution a yearly revenue, stated by Dugdale at 259*l.* 13*s.* 7*d.* and by Speed at 294*l.* 12*s.* 9*d.* Of the abbey-church, scarcely a vestige remains, but considerable portions of the other buildings are yet standing. Phillips' History and Antiquities of Shrewsbury, 4to. Some Account of the ancient and present State of Shrewsbury, 12mo. 1808, an interesting and judicious topographical work. Beauties of England and Wales, vol. xiii. by J. Nightingale and R. Rylance.

SHREWSBURY, a town of America, in the state of New Jersey, and county of Monmouth, on the Sea board, having Middletown on the N., Freehold W., and Dover S.W. It is divided from Middletown by North river, which is navigable for a few miles. The compact part of the town is pleasant, and contains an Episcopal and Presbyterian church, and a meeting-house for Friends. The number of inhabitants is 3773. This place is frequented in summer by genteel company from Philadelphia and New York, for health and pleasure; 79 miles E.N.E. of Philadelphia.—Also, a township of America, in Rutland county, Vermont, between Clarendon on the W. and Saltash on the E., containing 990 inhabitants.—Also, a township of York county, Pennsylvania, containing 1792 inhabitants.—Also, a township in Worcester county, Massachusetts, incorporated in 1727, and containing 1210 inhabitants; 6 miles E. of Worcester.—Also, a town of Pennsylvania, in Coderus creek; 10 miles S. of York.

SHREWSBURY, a river of New Jersey, which runs into the Atlantic, N. lat. 40° 22'. W. long. 74° 2'.

SHRIKE, in *Ornithology*, an English name for several species of the *Lanius*; which see.

SHRILLA, in *Geography*, a town of Africa, in Ludamar; 38 miles E.S.E. of Benown.

SHRIMP, in *Natural History*, is the *CANCER Crangon* of Linnæus; which see.

This shell-fish inhabits the sandy shores of Britain in vast quantities, and is reckoned the most delicious of the genus. Some writers have classed it under the genus of *SQUILLA*.

The white shrimp, or *cancer squilla*, is the prawn. (See *CANCER Squilla*.) It inhabits the coast of Kent.

By 30 Geo. II. c. 21. white shrimps in the river Thames and Medway are only to be taken from Bartholomew day to Good Friday; and red shrimps in the river Medway only from April 25 to July 1.

SHRINE, formed from *serinium*, a *desk*, or *cabinet*, a case to hold the relics of some saint.

SHRITE, in *Ornithology*. See *MISSEL-BIRD*.

SHROFF; a sort of banker or money-broker in the East Indies. See *RUPEE*.

SHRONDO, in *Geography*, a town of Africa, in the kingdom of Dentila, in which are considerable gold mines.

SHROPSHIRE, one of the midland counties of England, is situated between 52 and 53 degrees N. latitude, and 2 and 3 degrees W. longitude, from London. It is bounded on the S. by the counties of Worcester and Hereford; on the E. by Staffordshire; on the N. by Cheshire, a detached part of Flintshire, and by Denbighshire; and on the W. by the same county, and those of Radnor and Montgomery. According to archdeacon Plymley's "General View of the Agriculture of Shropshire," it extends about 44 miles in length, 28 in breadth, and 134 in circumference, comprising an area of 890,000 acres, or about a 45th part of England and Wales united. In shape it approaches to that of an oval, and is separated into two almost equal divisions by the river Severn. The parliamentary returns of 1811, state the number of houses it contains at 36,853, and its population at 194,298 persons, of whom 95,842 were males, and 98,456 females.

Historical Events.—When the Romans invaded this island in the reign of the emperor Claudian, this county was inhabited by two British tribes, called the Ordovices and Cornavii, whose respective territories were bounded by the Severn. The Ordovices, who appear to have been a most warlike and enterprising people, joined with the Silures, under the renowned Caractacus, to defend their country. Among the hills of Shropshire, that great chieftain for a time successfully strove against the overwhelming tide of Roman conquest; and here, several antiquaries contend, was fought the unfortunate conflict which terminated his military career, and led to his captivity. After that event, Shropshire formed part of the province called Flavia Cæsariensis, and seems to have been held in undisturbed tranquillity so long as the Romans remained in Britain; but when they withdrew their forces to the continent, it again became the theatre of war between the Britons and the Saxons. For some centuries it constituted part of the kingdom of Powisland, of which Pengwerne, now Shrewsbury, was the capital (see SHREWSBURY); but in the reign of the great Offa it fell under the dominion of the Saxons, when the British princes retired to Mathrafael, in Montgomeryshire. To secure his conquests, Offa formed an immense rampart of earth, extending about 100 miles in length along the confines of Wales; but the utility of this work, for the purposes of defence, seems to have been very inconsiderable, as we find the Welsh constantly making inroads into the Mercian territories.

In the ninth century, when the Danes invaded this island, Shropshire shared in the calamities which their ferocity brought upon the kingdom, but in a much less degree than most other counties. During the reign of Edward the Confessor, Gruffydd, prince of North Wales, became the terror of the English by his incursions into this county. Harold undertook an expedition against him, in which he was so successful, that the Welsh were glad to purchase peace by the

SHROPSHIRE.

the massacre of their chief. After the conquest, nearly the whole of Shropshire was bestowed on Roger de Montgomery, a relation of the conqueror's; but the inroads of the Welsh frequently disturbed him in the enjoyment of his splendid acquisitions. In 1067 they laid siege to Shrewsbury, the feat of his baronial power, with so formidable a force, that the king found it necessary to march against them in person, when they were defeated with great slaughter. This discomfiture, however, only served to increase the warlike spirit of the Welsh; and William, finding himself foiled in his repeated attempts to reduce those high-spirited foes to submission by open combat, adopted a more politic mode of warfare. He issued grants to certain of his favourites of all the lands they should be able to conquer from the Welsh; and endeavoured to divide and weaken the Welsh border chieftains themselves, by promising a confirmation of all the rights and privileges to such of them as would simply acknowledge the sovereignty of the English crown. Hence appears to have originated the feignories and jurisdictions of the lord marchers, whose power was even more arbitrary and despotic than that of the monarch himself. They constructed and repaired fortresses at their pleasure, and garrisoned them with soldiers of their own. They likewise built towns, and exercised the most absolute authority, both civil and military, within their respective territories. In later times, however, this power was considerably controlled by a chief court of the marches of North Wales, which was generally held at Ludlow, but sometimes also at Shrewsbury and other towns; and was still more limited after the union of Wales with England, from which period no lord marcher could exercise any prerogative not confirmed to him by charter, without a special licence from the crown. During the various revolts which occurred subsequent to the death of Edward I., and also during the contentions for the crown between the houses of York and Lancaster, Shropshire was occasionally the scene of military contests, of which the most celebrated was the battle of Shrewsbury. When the civil war broke out in the 17th century, this county was peculiarly distinguished for its loyalty; but except the taking of the county-town by the parliamentary forces, no transaction of peculiar interest happened within its limits throughout that unfortunate era.

General Aspect, Soil, and Climate.—Shropshire possesses within its boundaries almost every variety of natural charm; the bold and lofty mountain; the woody and secluded valley; the fertile and widely cultured plain; the majestic river, and the sequestered lake. The soil is no less various. In the hundred of Oswestry, a deep loam and gravelly soil prevail; and in those of North Bradford and East Brimstrey, a light or sandy loam. Pimhill hundred contains a mixture of "boggy land, and of sandy soil, with a greater proportion of sound wheat land." In the other hundreds, clays of different consistence form the most general soil; but there are numerous patches and extensive tracts both of deep and sandy loam, gravel, &c. The climate of course partakes of the character of its surface and soil. On the eastern side of the county, where the land is warm and flat, harvest frequently commences a fortnight sooner than near the middle of the county, where the vales are extensive, but the surface less light, and the bottom often clayey; and hay and grain are both gathered earlier there than on the western side, where the vales are narrow, and the high lands frequent and extensive, although the soil is not in general so stiff. The easterly winds prevail most in spring, and those from the west in autumn; but the easterly winds are the most regular; those from the west blowing for a series of months (five

or six perhaps) strong and frequent, and then for nearly a similar period less often and less violent. The same may be said of the wet and dry seasons in this county, but the periods of both appear to be much shorter.

Rivers and Lakes.—Shropshire abounds with rivers as much as any county in England. The principal among them is the Severn, which, after bounding the county for several miles, enters it near Molverley, and flows on in an irregular serpentine channel to Shrewsbury, which it nearly encircles. At this town it turns towards the north, but soon again sweeps to the southward, passing by Wroxeter, Madeley, and Bridgenorth, to Bewdley, where it enters Worcestershire. Its course within Shropshire is estimated at nearly seventy miles in length, throughout the whole of which space it is navigable for barges, trows, wherries, and boats, and is abundantly supplied with fish of various denominations. The contributory streams to this great river, belonging to the county, are the Camlet, the Vyrnyw, the Morda-Brook, the Perry, the Meole-Brook, the Rea, the Tern, the Bell-Brook, the Cund-Brook, the Worf, the Marbrook, and the Bore-Brook, all of them considerable waters. Those of most importance, which do not join the Severn, are the Morles, which falls into the Dee, the Teme, the Shelbrook, the Elf-Brook, the Weever, the Clun, the Ony, which discharges itself into the Teme, in Herefordshire, and the Corve; but besides these, there are nearly a hundred streams of minor extent, which our limits will not permit us to mention. The lakes here are numerous, but none of them are very extensive. That of Ellesmere, which is the largest, covers about 116 acres of ground.

Minerals.—Shropshire is well supplied with minerals. The mines of lead-ore, on the western side of the county, are extremely productive, and their product is reckoned to be of excellent quality. Copper and calamine are likewise found here in great quantities, but neither of them has hitherto been mined with any degree of success. Coal of a superior kind is wrought on the eastern side of the county, particularly in the parishes of Wellington, Lilleshall, Wrockwardine, Wombridge, Stirchley, Dawley, Little-Wenlock, Madeley, Barrow, Benthall, and Broseley. It is likewise found in the hundred of Stottesden, and to the southward of the Cleve hills; also on the north and north-west confines of the county. Iron-stone, as is usually the case, accompanies the coal strata, as well as lime-stone, which is quarried in various places, but particularly at Lilleshall, Porth-y-Wain, and Llanymynach, and in the parishes of Cardifston and Alberbury. This county further contains abundance of building-stone, and slates for covering roofs. At Pitchford, about seven miles S.E. from Shrewsbury, is a red sand-stone, approaching the surface in many places, which exudes a mineral pitch. From this rock is extracted an oil, known by the name of Betton's British oil. Mr. Arthur Aikin is preparing an interesting publication on the mineralogical stratification of this county.

State of Property, &c.—The extent of estates in this county is very various. While the possessions of a few noblemen and gentlemen include from 10,000 to 25,000 acres each, there is an infinite number of freeholders' and yeomen's estates of all inferior sizes. The number of freeholders entitled to vote amount to above 3000; and the total rental of the county, tithes inclusive, to about 900,000*l.* There is much copyhold tenure, but of easier customs than in most of the neighbouring counties. The lords of some customary manors have enfranchised the copyholders, upon receiving an equivalent in money; but the customs of the greater number are still preserved and acted upon. In the manors of Ford, Cundover, Wem, and Loppington,

SHROPSHIRE.

ington, the lands descend to the youngest son; and in the manors of Cardigan and Stretton, (where the eldest son succeeds,) in default of sons, the daughters are co-heiresses.

Agriculture.—The extent of farms is nearly as various as that of estates; but in general they are of a large size, and are, in some instances, held on leases for life; in others, for seven, ten, or twenty-one years; and, in many cases, from year to year only. The crops commonly cultivated are wheat, barley, oats, pease, turnips, and potatoes; hops, hemp, flax, and cabbages, are only raised in small quantities. The growth of hay and the improvement of pasture lands are rather neglected branches of Shropshire agriculture; but on the borders of the Severn, and in the vicinity of several of the lesser streams, there are many excellent tracts of meadow land, which produce grass in great luxuriance, without the aid of any other manure than what is deposited by the floods. The grasses most common in the county are the following: the sweet-scented vernal grass, Timothy grass, meadow fox-tail, and some species of the agrostis; but the latter flower too late to be of much use for cultivation. Several varieties of the poa and festuca are likewise common.

Woods and Plantations.—Notwithstanding large yearly falls of timber, there still remain in Shropshire some fine woods of oak, and a vast number of good hedge-row trees, chiefly ash and oak. Birches, both as trees and as fences, are common in the south-west district. There are besides, in this county, many large tracts of coppice-wood, and several extensive modern plantations; but the former suffer much by the demand for charcoal, which the numerous iron works in this and the adjoining counties occasion.

Of *waste lands*, Shropshire is comparatively free. Almost all the lands in cultivation are inclosed; and the commons are every day decreasing, so that few of any great extent remain, except that of Morf, near Bridgenorth, which measures five miles in length, and nearly three in breadth; and the high lands between Church-Stretton and Bishop's-Castle, and from Clun to the borders of Radnorshire, which are solely occupied as sheep-walks, and perhaps could not be better employed. There are several large mosses, and many smaller ones, in Shropshire. The chief district of moor-land is that in the vicinity of the village of Kinnerley.

Roads and Canals.—The turnpike-roads of this county are excellent; but the parish roads are in general bad, and the repair of them much neglected, from the want of proper surveyors. Canals, though late of introduction into Shropshire, are now frequent. The chief cuts are the Shropshire canal, which commences at Donnington wood, and terminates at Coal Port on the Severn, running through an extensive assemblage of coal and iron works; the Ketley canal, which joins that of the Shropshire; the Shrewsbury canal; and the Ellesmere Navigation, which forms in itself a system of canals, extending through that large and fertile tract of country which lies between the Severn on the south and the Mersey on the north, and between the confines of North Wales on the west and the borders of Staffordshire on the east, a space of 50 miles in length, and upwards of 20 in breadth, exclusive of the vallies which open into North Wales. Its grand object is to unite the Severn, the Dee, and the Mersey, and by that means open a communication between the district above mentioned and the ports of Liverpool and Bristol.

Manufactures and Commerce.—Among the manufactures of Shropshire, those of Ketley and other places in the iron district are the most considerable. Garden-pots, and other coarse earthen vessels, are made at Broseley, which is likewise

noted for the manufacture of excellent tobacco-pipes. At Caughley, in the same neighbourhood, is a china manufacture of great excellence, and at Coal Port is another of the same kind; besides one of that species of earthenware called the Queen's or Wedgwood ware. Shropshire also contains several mills for dyeing woollen cloths, and some cotton and linen manufactories. These various products of course form a considerable share in the commercial means of Shropshire, but its principal traffic is probably the staple trade of Shrewsbury, in flannels and Welsh webs, which are bought in large quantities at the markets of Pool and Oswestry, and are not only sent to every part of the kingdom, but are exported to different quarters of the world, particularly to the West Indies and to South America.

Civil and Ecclesiastical Divisions and Government.—Shropshire, like every other county in England, is governed by a lord lieutenant and custos rotulorum, a high sheriff, and a number of justices of the peace, besides the magistrates of the privileged towns. It is divided into fifteen hundreds, or districts, answering to that denomination; namely, Oswestry, Pimhill, North and South Bradford, Brimstrey, the liberty of Shrewsbury, the franchises of Wenlock, and the hundreds of Stottesden, Ford, Chirbury, Cundover, Munslow, Overs, Purflow, and the honour of Clun. These again are subdivided into 229 parishes, part of which are within the diocese of Litchfield and Coventry, and part within those of Hereford and St. Asaph.

Parliamentary Representation and Chief Towns.—Shropshire sends twelve members to parliament, two knights of the shire, and two burgesses for each of the boroughs of Shrewsbury, Ludlow, Bridgenorth, Wenlock, and Bishop's-Castle. The principal landed proprietors who have an influence in the representation, are the earl of Powis, the lord Bradford and Berwick, the Hills, the Corbets, and colonel Forester. The market-towns in the county are, Church-Stretton, Clebury-Mortimer, Ellesmere, Hales-Owen, Madeley, Newport, Wem, Great-Wenlock, Oswestry, Whitchurch, and Wellington.

Antiquities.—Shropshire contains a great many objects of antiquarian interest. The chief Roman stations within its limits were Uriconium, now Wroxeter, Mediolanum, near Drayton, and Rutunium, near Wem. Antiquaries differ respecting the precise position of the two last, but with regard to the former, there is little doubt but it was a chief city of the Cornavii, founded and fortified by the Romans. Watling-street enters the county on the east, between Crackley-wood and Weston, and passes through it in a bending line to Leintwardine, in Herefordshire, on the southern borders. Of the Saxon period no ascertained remains exist; but of the Norman era, and of subsequent times, there are many; as the castles of Shrewsbury, Ludlow, Bridgenorth, Clun, and Red Castle, and the abbies of Shrewsbury, Haughmond, Buildwas, Wenlock, and Hales-Owen, several priories, and a great number of curious churches. The most remarkable encampments are those of Bury Ditches and the Walls, and at Purflow, Basford Gate, and Hawkstone. A General View of the Agriculture of Shropshire, by Joseph Plymley, M.A. Archdeacon of Salop, 8vo. 1803. Beauties of England and Wales, vol. xiii. by J. Nightingale and Ralph Rylance, 8vo. 1811.

SHROUD, from the Saxon *shroud*, a *shelter*, or *cover*, is used to denote the dress of the dead. This is required by statute to be made of sheep's wool only. See **BURIAL**.

If any one, in taking up a dead body, steals the shroud, the property of which remains in the executor, or the person who was at the charge of the funeral, it is felony.

SHROUDS, in *Sea Language*. See **SHROVES**.

SHROVE.

SHROVE-TIDE, the time immediately before Lent ; thus called by our ancestors, because employed in *shriving*, that is, in confessing their sins to the priest, in order to a more devout keeping of the ensuing Lent fast.

Shrove-Tuesday is the day next before the first of Lent.

SHROWDING of Trees, the cutting or lopping off the top branches : this is only practised to trees that are not fit for timber, but designed for fuel, or some other present use.

Such trees the husbandmen find much preferable to coppice, as they need no fence to secure them ; because they stand in no danger from the browings and rubbings of cattle, which too have the benefit of grazing under them.

As for the time of shrowding, it is not to be practised till the trees have stood three or four years ; and then it must be done either at the beginning of the spring, or the end of autumn.

Those of the harder sort are not to be lopped above once in ten or twelve years, and that at any time in the winter. The pithy and soft woods are best shrowded in the spring. The stumps left should always be cut aslope, and smooth, in order to cast the water off, and prevent its sinking in, and rotting the tree.

SHROWDS, or **SHIROUDS**, in *Sea Language*, are great ropes in a ship, which go up on both sides of all masts, except the bowsprit :

The shrouds are always divided into pairs, *i. e.* one piece of rope is doubled, and the two parts fastened together at a small distance from the middle, so as to leave a sort of noose or collar to fix upon the mast-head.

They are fastened below by chains to the ship's sides, and aloft, over the head of the mast ; their pennants, fore-tackle, and swifters, being first put under them : and they are served there, to prevent their galling the mast. The top-mast shrouds are fastened to the puttocks, by plates of iron, and by what they call *dead-men's eyes*, and laniers also, as the others are. See **PUTTOCKS**.

The shrouds, as well as the sails, are denominated from the mast to which they belong. Thus they are the main, fore, and mizen shrouds, the main-topmast, fore-topmast, or mizen-topmast shrouds, and main-top-gallant, fore-top-gallant, or mizen-top-gallant shrouds.

The number of shrouds by which a mast is sustained, as well as the size of the rope of which they are formed, is always in proportion to the size of the mast, and the weight of the sail it is intended to carry. The two fore-mast shrouds, on the starboard and larboard side of the ship, are always fitted first upon the mast-head ; and then the second on the starboard, and the second on the larboard, and so on till the whole number is fixed.

The intention of this arrangement is to brace the yards with greater facility, when the sails are close-hauled, which could not be performed without great difficulty, if the fore-mast shrouds were last fitted on the mast-head, because the angle which they would make with the mast would then be greatly increased. Falconer.

Bowspit shrouds are those which support the bowsprit. **Bumkin** shrouds are those which support the bumkin. **Futtock** shrouds are those which connect the efforts of the top-mast shrouds with the lower shrouds. **Bentinck** shrouds are additional shrouds to support the masts in heavy gales. **Preventer** shrouds are similar to **Bentinck** shrouds, and are used in bad weather to ease the lower rigging.

The terms are, *ease the shrouds* ; that is, slacken them.

Set taught the shrouds ; that is, set them faster.

SHROWD Trucks. See **TRUCKS**.

SHROWD Stoppers. See **STOPPERS**.

SHRUBS, in *Botany* and *Vegetable Physiology*, are commonly understood to be plants with a perennial woody stem, of a more humble or slender form of growth than trees. Linnæus once attempted to define the limits between trees and shrubs, by the former having leaf-buds, the latter none ; but this distinction was soon found to be of no avail. Trees of hot countries have generally no buds, while many very humble shrubs of cold ones are furnished with this protection. This is so obvious, in Willows for example, that Linnæus probably only meant to apply the rule *generically*. Thus the whole genus of *Salix* having buds, and being mostly arboreous, every species of that genus, however diminutive, must be deemed a tree. Accordingly, *S. herbacea*, hardly an inch high, is termed in the *Flora Lapponica*, the least of all trees. But the shrubby genus *Lonicera* has still more elaborate buds than *Salix*.

SHRUB, in *Gardening*, a low woody plant of branchy growth and ornamental appearance ; it is sometimes, however, of a large growth and stature. Shrubs are commonly divided into the evergreen and deciduous kinds ; and they may be subdivided still farther into the exotic or tender and the hardy sorts, as well as into such as are rarely seen or met with, and such as are well known and in common cultivation. In the former as well as latter of these great divisions, the plants may likewise be separated and arranged according to their sizes, forms, modes of growth, colours, and other particulars : in the last of which, it has been observed, there is every shade between the ruscus, which is among the least, and the Bermudian juniper, which is nearly the largest ;—from the holly, which is slightly tinged with red, to the box, which is of a golden yellow :—in shape, from the cypress, which grows in the form of a spire, to the daphne terton raira, which forms a globular tuft upon the surface of the ground ;—from the hederæ, which fastens itself to the wall, to the andromeda and vinca, which recline themselves upon the surface.

In the latter, the plants are said to be diversified in each of these particulars, being capable of division, as they may be cultivated principally for the beauty of their flowers, as the rhododendron, erica, and many others ;—for the smell, as the sweet briar, absinthoides, eleriodendron, jasminum, and some others ;—for both these qualities, as the rose, Cape jasmine, and a few more :—or as being grown, in a great measure, for the beauty of the leaves, as the acuba, variegated holly, elder, and some others ;—for the purpose and appearance of the fruit, as the mespilus pyracantha and the orange ;—for the beauty of the whole plant, as the aristotelia, and several others ;—and, lastly, the greatest proportion for all these properties together, as the myrtle, laurustinus, laurel, and some others. Some of these, however, belong to the former of the above general divisions or classes.

Shrubs are of very great importance in forming all sorts of collections in gardens, and other places ; and in ornamental pleasure-ground works they constitute a class of materials of the most interesting kind, which cannot be done without.

In such situations and works they are arranged, varied, and placed out, in many different ways, so as to produce the most pleasing effect and variety in the particular intentions with which they are planted or set out. See **SHRUBBERY**.

It has been observed by Mr. Loudon, in his work on "Ornamental Gardening," that the evergreen class of shrubs are deficient in most situations, as well as trees of the same sort ; but that they deserve to be very generally planted, equally on account of their uncommon beauty in the

the winter season, as for their contrast with the yellow and russet tints of the deciduous kind, and trees of the same nature, in the autumnal and spring seasons. They ought, generally, according to him, to be the prevailing sorts planted near the houses and buildings of country-seats, not only for the reasons suggested above, but because they are capable of concealing some part or parts of the edifices, disguising their real extents, and thus blending them at all seasons with the surrounding scenery. There is also another circumstance in their favour, which is the superiority of their shelter and shade.

It is thought, also, that the cypress is too seldom planted in such situations, as it has the capability and power of giving a rich classical appearance and effect to them; as is seen in some cases, as at Foxley and Yoxal Lodge.

And the holly, it is suggested, should be planted still more than any other shrub, in particular cases; as no other is capable of affording and producing such an excellent and diversified effect in woody scenery, as is exemplified in some forest situations.

The ivy is capable, it is said, of answering three important uses, and of course deserving of more frequent growth. These are the varying of the stems of single trees, and small groups of them; the giving of effect to old decaying trees, and the rendering of ugly trees interesting, as well as other similar rural purposes; the producing of variety in different sorts of buildings; and the giving of ornament and utility to works of the country kind.

In the first of these intentions, in different cases, where the number of trees of the same kind are considerable, and very much alike, which are in the fore-ground, one or several of them may be varied and diversified by the ivy shrub, in probably as happy a manner, and with as good an effect, as in any other way, and better than by the use of any sort of deciduous climbing plant. Single trees can always be rendered interestingly different by these means, as well as old and ugly trees of different sorts.

In the second use, where cottages, ruins, irregularly formed buildings, old houses, and other similar structures, are to be varied, partially concealed, and rendered different in their external appearance, but which cannot be cheaply enough done in other ways, they may be highly and richly diversified and decorated by the simple planting of the ivy shrub, and directing it so as to cover in different places or parts. The expence of such works would also be less, in many instances, it is remarked, if the external appearance of them were contrived so as to admit this plant; which would not only vary and alter them generally, but might occasionally be substituted for, and supply the place of, particular parts, as is exemplified in many instances.

The last of these intentions is that of planting the ivy shrub against walls of the stone kind, dikes, and sunk fences between fields, and other similar purposes, in the view of rendering them more ornamental and durable. The chequering of them in this way, on their sides, with shades of green, and little ribs or columns, and richly mantling their tops, have, it is said, much effect in producing variety, and at the same time in rendering them more lasting. Mortared and unmortared walls are likewise preserved and secured by it. This creeping shrubby plant may consequently be of extensive utility in various ways; as, besides affording beauty, shelter, and durability, it may be beneficial in thickening hedges in the vicinity of the sea-coast, when joined with the elder. It should, in all cases, be carefully planted, either by sets or young seedlings, which last is by much the readiest mode of raising and providing it. Nothing more is wanting, as it succeeds well in most soils,

situations, and exposures. Where tall plants are wanted for particular uses, they must be provided with good roots.

In the deciduous kind of shrubs, the modes of varying and planting are very different, according to their nature, habits, sizes, and other qualities and circumstances. For the most part, however, the larger sorts are put more out of the way, in order that the smaller and more curious kinds may be more fully exposed to view. The peculiar properties in some of this description of shrubs also direct the modes and manners of planting them, as that of the time of flowering, and several others. They are varied and planted differently, likewise, for a great variety of other different reasons.

In planting the laburnum, as there are two sorts, which differ greatly in their spray or small twigs and foliage, that with the smaller and more delicate branches and flowers should constantly be chosen for putting out with other shrubs; the other, which is of much larger growth, is well suited for poor gravelly soils, rocky banks, and the rocky margins of water, where, in the two latter situations, the plants may sometimes be seen in great perfection.

Shrubs of these different kinds are raised and produced in many different ways, as may be seen under their different particular proper heads.

Some sorts of shrubs, particularly in the early state of their growth, stand in need of not merely a soil and situation, but a mode of cultivation which is adapted to their different natures and habits. And though most shrubs require to have the earth or soil about them either frequently stirred, or kept clean and free from all plants of the weed kind, there are some that succeed best when the surface of the ground is overrun with low plants of the moss kind.

In all cases, shrubs are to be preserved in a neat and perfect order, by the removal of the decayed and withered parts, and the proper cutting in of particular shoots and branches where necessary, especially in some of the deciduous kinds. In the evergreen class, the knife or shears, however, are very seldom to be applied, except for the removal of the destroyed parts, which are constantly to be carefully taken away.

SHRUB, Fruit, that sort of low shrubby plant which bears fruit of some kind or other. Shrubs of this kind are mostly very useful, and not few in number. The sorts are various, as the gooseberry, the currant, the raspberry, and some others, cultivated in garden situations; and the berry or barberry, and a few other kinds, in those of the shrubbery. Shrubs of this description, in most cases, require careful attention in cutting, managing, and keeping the ground in proper order, by due cultivation, and the proper use of suitable manure. See *SMALL Fruits*, and *STANDARD Fruit Trees*.

In planting them, those of the garden sort are most properly and usefully put out in situations by themselves, and not in the usual mode, on the sides or borders of the different cultivated compartments of the garden ground.

Those which produce ornament, as well as fruit, are to be placed out in variety with other shrubs, in the more open parts of shrubberies, or alone in particular cases.

SHRUBS, Stealing of. See *LARCENY*.

Wilfully spoiling or destroying them is a species of that malicious mischief, which subjects the offender to pecuniary penalties for the first two offences, and for the third, if it be committed in the day-time, and even be the first at night, to the guilt of felony, and transportation for seven years. 6 Geo. III. cap. 36. and 48.

SHRUBBERY, in *Gardening*, a tract, portion, or space of ground, which is planted with shrubs, trees, and flower plants,

SHRUBBERY.

plants, for the purpose of ornament. The term is, however, perhaps the most properly applied to narrow belts and strips of ground, planted with shrubs and flowers, which are sometimes the principal ornaments of small seats, and other similar constructions and conveniencies. They are contrived in different forms and modes, for the purpose of giving the desired effect; and the notion of such schemes of planting shrubs and flowers is considered by Mr. Loudon as good and proper, as when executed according to the principles of nature and good taste, they must produce effects of the interesting as well as the pleasing kind; but that from the reverse having been so frequently the case, their tawdry insipidity has been justly reprobated by some, as Mr. Knight, in the following line, &c.

“Curse on the shrubbery’s insipid scenes.”

It is supposed that shrubberies are, in general, made and contrived with the intention of procuring walks, which may either conduct or direct to some particular place or scene, such as the kitchen garden, the farm, a wood, or any other similar object; or they may lead and extend merely through the shrubberies, for their own sakes, and such views of external objects as can be produced from them, or as are deserving of attention. In designing and forming shrubberies, therefore, keeping the above in view, these three points will, it is thought, require to be particularly attended to: first, the arrangement, distribution, and grouping of the shrubs, which ought to be that of general nature; in the second, the intermixing of the glades and pastures, which, in most cases, is an essentially requisite consideration; and in the third or last, the judicious introduction of the views of the more distant scenery, which is generally desirable, unless in such parts as, by way of utility or contrast, are preserved in a state of umbrosity.

The two latter requisites are, it is said, naturally connected with picturesque improvements, the general principles of which are blended and intermixed with this branch of ornamental gardening.

The directions which this able designer of rural works of this nature has given for the forming of shrubberies with proper taste, in different cases, situations, and circumstances, are, that when such groups of shrubs and flower plants are small and placed upon lawns, they should always be of very irregular shapes; but that, when upon gravel, their forms must depend upon circumstances. In cases where they are in a part in which art is avowed and ought to prevail, then the more artificial the forms are, so much the better; but that if merely a group for separating, dividing, or varying a road, walk, or natural path at a distance from artificial scenes, then the shape should be as irregular as in those upon lawns. Whether such shrubby groups are made in a regular or irregular manner, they almost in every case require to be cultivated or wrought over for some years afterwards. This, in the mode of digging and working them which has been usually had recourse to, produces, it is said, a harsh and disagreeable boundary line; which, in addition to the means of proper arrangement, suitable grouping, and the natural connection of surface, may be improved principally, it is supposed, by the destruction of such lines of separation in as complete a manner, as high a degree, and as extensively as possible. Nothing, it is thought, can be more readily or more easily accomplished, as it is only requisite to keep the earth on the margins or borders of such groups of the same level as the surfaces of the lawns or pastures, and to suffer both to unite and blend harmoniously together, or with each other. And as all groups of this shrubby kind are only dug or wrought over during a certain period of

time, as until the shrubs become so large as to render further culture unnecessary; the pasture should be allowed to gradually encroach and spread itself among the shrubs and flower plants, until at last it wholly covers the surface. After this, the shrubby group becomes rough and picturesque; the flower plants, still continuing to grow among the shrubs, will, it is supposed, be productive of exactly what is seen to happen in natural groups; with this elegant difference, that in place of nettles, thistles, and such coarse gross weeds, which however, it is remarked, are as good to the painter as the finest flower plants, there will be had the narcissus, saxifrage, saponaria, and others, which are quite in character with the rest of the pleasure-ground, and thrive well among pasture. It is suggested, that in planting the shrubs in such groups, the great art consists in putting them in irregularly; for though the outline of the ground to be cultivated must, even under the best taste, be somewhat formal, yet the shrubs can always be planted as irregularly as if no outline or form of group existed. This is, however, said to be a plan or manner of distribution, which has never been put in practice; as whatever the form of the ground may be which is to be dug and planted, the shrubs are distributed in a regular manner over every part of it:—even when digging is no longer attended to, still none of the shrubs are thinned out, but the whole left a formal unconnected clump of vegetation, an appearance, it is observed, as different from the irregular group-thickets of nature, as a green hillock is from a rocky precipice. It is stated, however, that the groups of this nature, or rather those masses of formal shapes which are placed in particular situations, such as ovals in the fronts of small villas, or basket-work patches upon the lawns in the fronts of residences of the mansion kind, should always have determinate outlines; as being devoted, in a great measure, to tender flower plants and flowering shrubs, they will require to be constantly in a cultivated state. Their outlines or boundaries may, it is supposed, be properly formed, according to circumstances, either of elegant masonry, wood, basket-work, or of plants of the flower kind, such as thrift, the daisy, and some others, and not unfrequently, when surrounded by gravel, by a broad margin of turf. In regard to the general forms of such shrubby planted masses, it is said that they may be oval, circular, pentagonal, or fanciful, according to pleasure; and that their surfaces may either be kept level with the lawns or other parts, or be gradually raised from their margins to their centres. It is however noticed, that when raised in this way, the sides should always be made to present a concave slope, and not that of a convex one, as is most commonly the case, and which has a very bad effect in different instances, as in the public squares of the metropolis, &c. Basket-work shrubby groups have not unfrequently, it is remarked, a very pretty effect when covered with moss. Others which are unconnected among themselves, and which have shapes that are rather unsuitable to the nature of the situations in which they are formed, are likewise productive of variety. In all cases, some sort of agreeable effect ought to be afforded in as striking a manner as possible.

It is conclusively remarked, that though the connection of surface in such shrubby groups is always of importance, neither those of the irregular or regular shapes ought ever to be placed in any situation, except where they have a proper relation and union with what surrounds them.

In the larger and more extensive works of the shrubby kind, the same rules and principles will be necessary to be had recourse to, but with a greater attention to the production of variety and effect. These are to be accomplished by such

such means as have been already suggested, and by giving them a more natural conformity, as well as by the introduction of greater diversity in the shrubs, trees, and other sorts of plants that are made use of in the formation of them. It is indeed observed, that one of the most effectual means of rendering rural scenes still more interesting than they commonly are, is by introducing a more extensive variety of shrubs than is usually employed, a vast number of which are capable of answering the purpose. They are not, however, to be planted in such situations in the common indiscriminate manner, but with much regard to the effect which they are to produce. In short, it is concluded, that it is in the shrubbery, or those parts of pleasure-grounds which contain flower plants, shrubs, and trees,—which occupy considerable space,—exhibit views of the country or of other parts of the ground, that ornamental gardening and picturesque improvement blend themselves together in producing those happy effects which so much interest the feelings and fancy.

SHRUBBY-Howk-Weed, in *Agriculture*, a plant of the shrubby weed kind, which is often troublesome and injurious in woods and plantations. See **HIERACIUM**, and **WEEDS**.

SHRULE, in *Geography*, a river of the county of Tyrone, Ireland, which joins the Moyle near New Town Stewart. There are also several parishes of this name in Ireland, but none called from a town now existing, except Shrule in the county of Mayo, on the borders of the county of Galway; 106 miles N. by W. from Dublin.

SHTUKA, a powerful tribe or kabyle in the province of Sufe, in the southern division of the empire of Morocco, inhabited by Shelluks, amounting in number to 380,000.

SHUARIF, a small low island in the Red sea, near the coast of Africa. N. lat. $24^{\circ} 22'$.

SHUBENACADIE, a river of Nova Scotia, which rises within a mile of the town of Dartmouth, on the E. side of Halifax harbour, and discharges itself into Cobiquid bay, receiving in its course the Slewinn and Gays rivers. The large lake of the same name lies on the E. side of the land that leads from Halifax to Windsor, and about 7 miles from it, and 121 from Halifax.

SHUCK, in *Agriculture*, provincially a flouk, or twelve sheaves of corn set up together in the harvest field.

SHUD, in *Rural Economy*, a word sometimes provincially used to signify shed.

SHUG, in *Agriculture*, a term used to imply the shaking of any thing, as hay, &c.

SHUGGINGS, a word signifying that which is shed or scattered, as grain at harvest, &c.

SHUHUSHU, in *Geography*, a village of the pachalic of Bagdad, one day's sail from Korna, and situated on the bank of the Euphrates. It is as large as Samavat (which see), but much more flourishing; for the Euphrates, which is navigable, even in the driest season, for boats of considerable burthen as far up as this place (where the effects of the tide are also felt), enables the inhabitants to carry on a trifling traffic with Bassora. Shuhushu is a great mart for horses, and is famed for the richness of the cloves raised in its vicinity.

SHUK, in *Agriculture*, a term sometimes provincially applied to a husk or shell.

SHUKERA, in *Geography*, a town of Thibet; 42 miles S. of Gangotre.

SHULA, or **SHULI**, in *Mythology*. See **SULA**.

SHUMAN, in *Geography*, a town of Grand Bucharia; 30 miles W. of Vashgherd.

SHUMBERG, a town of Istria; 5 miles N.N.E. of Pedena.

SHUME, or **ASSHUME**, a violent hot wind of Africa, or, as they are called, **Oncas**, which, in the intermediate journeys between several parts of the Desert or Sahara, occasions great inconvenience and distress to travellers. It sometimes wholly exhales the water carried in skins by the camels for the use of the passengers and drivers: on which occasions the Arabs and people of Soudan affirm, that 500 dollars have been given for a draught of water, and that 10 or 20 are commonly given, when a partial exhalation has occurred. In 1805, a caravan proceeding from Tombuctoo to Tafilet was disappointed in not finding water at one of the usual watering-places, when, as it is said, all the persons belonging to it, 2000 in number, besides 1800 camels, perished by thirst. The intense heat of the sun, aided by the vehement and parching wind that drives the loose sand along the boundless plains, gives to the Desert the appearance of a sea, the drifting sands resembling exactly the waves of the sea, and hence aptly denominated by the Arabs "el Bahar billa mâa," a sea without water. During the prevalence of this wind, it is impossible to live in the upper rooms of the houses; so that the inhabitants retire to subterraneous apartments, cellars, or warehouses on the ground-floor, eating only fruits, as the water-melon or prickly pear, as the animal food at this time is loathsome whilst hot, and has scarcely time to cool before it becomes tainted. The walls of the bed-chambers, being of stone, are moistened by throwing upon them buckets of water, in order to render the rooms habitable towards the night; and so great is their heat, that in doing this, the effect is similar to that which is produced by casting water on hot iron. Mr. Jackson says that he has felt the shume 20 leagues out at sea. When in N. lat. 30° . W. long. $11^{\circ} 30'$, a quantity of sand fell on the deck. He adds, that he never found any extreme inconvenience from the shume N. of the province of Sufe, although at Mogodor it is sometimes felt, but not so severely, during three days.

The Akkaabahs, or accumulated caravans, which cross the great desert of Sahara, and consist of several hundred loaded camels, accompanied by the Arabs who let them to the merchants for transporting their merchandize to Fez, Morocco, &c. are sometimes obliged suddenly to strike their tents, and proceed on their journey, when the shume rises and drifts the loose sand along the plains, which attaches to every fixed object in its course, and soon buries it. We shall here add, that the guides of these accumulated caravans, being enabled by the two pointers to ascertain the polar star, steer their course with considerable precision, and that they often prefer travelling in the night to enduring the suffocating heat of the scorching meridian sun. When the Akkaabah reaches Akka, the first station on this side of the Desert, and situated on its confines, in Lower Sufe, which is a part of Biledulgerid, the camels and guides are discharged, and others are there hired to proceed to Fez, Morocco, Terodant, Tafilet, and other places. The Akkaabahs perform the traverse of the Desert, including their sojournments at El-wahs, or Oases, in about 130 days. Proceeding from the city of Fez, they go at the rate of $3\frac{1}{2}$ miles an hour, and travel seven hours a day: they reach Wedinoon, Tatta, or Akka, in 18 days, where they remain a month, as a grand accumulated Akkaabah proceeds from the latter place. In going from Akka to Tagassa, they employ 16 days, sojourning here 15 days more to replenish their camels; they then proceed to the Oasis and well of Taudeny, which they reach in seven days, and after staying there 15 days, they proceed to Tombuctoo, which they reach the sixth day, making a journey of 54 days actual travelling, and of 75 days' repose; being altogether, from Fez

Fez to Tombuctoo, 120 days, or 4 lunar months and 9 days. See **TOMBUCTOO** and **WEDINOON**. See also **CARAVAN**.

SHUMSHABAD, in *Geography*, a town of Hindooftan, in Lahore; 6 miles S.E. of Attock.

SHUMUM, a town of Egypt, on the Nile; 13 miles N.W. of Cairo.

SHUNAITÉ' EZZAILE, a town of Egypt; 30 miles S.W. of Girgê.

SHUNAR, a town of Hindooftan, in Bahar; 22 miles N.E. of Bahar.

SHUPARE, a town of Candahar; 45 miles N. of Attock.

SHURBA, a town of Asiatic Turkey, in Natolia; 30 miles E.S.E. of Boli.

SHURDHUR, a town of Hindooftan, in Guzerat; 50 miles E.N.E. of Junagur.

SHUREGIAN, a town of Persia, in the province of Kerman; 95 miles S.E. of Sirgian.

SHUREJAN, a district of Grand Bucharia, in the W. part of the kingdom of Balk.

SHURFFAH, a town of Algiers, near the coast; 6 miles E. of Dellys.

SHURMEEN, a town of Syria; 32 miles S.S.W. of Aleppo.

SHURMIN, a town of Persia, in the province of Khorassan; 25 miles N. of Maru-errud.

SHURPH el Graab, i. e. *the pinnacle of the ravens*, a rugged mountain of Algiers; 25 miles N. of Tremecen.

SHURUBUI, a town of Brasil, in the government of Para; 22 miles E. of Paxis.

SHUS, the name of famous ruins in the Persian empire, situated in the province of Kuzistan, or Chufistan, (the ancient *Sufiana*, which see,) about seven or eight miles to the west of Dezhphoul, a town which lies on the eastern banks of the Abzal, in a beautiful and spacious plain, 28 miles W. of Shuster, and celebrated for its elegant bridge of 22 arches, 450 paces in length, 20 in breadth, and about 40 in height, the piers of which are constructed of large stones, and the arches and upper parts of burnt brick. The ruins of Shus extend about twelve miles from one extremity to the other, stretching as far as the eastern bank of the Kerah, occupying an immense space between that river and the Abzal, and, like the ruins of Ctesiphon, Babylon, and Kufa, consisting of hillocks of earth and rubbish, covered with broken pieces of brick and coloured tile. The largest and most remarkable of these mounds stand at the distance of about two miles from the Kerah. The first is, at the lowest computation, a mile in circumference, and nearly 100 feet in height; and the other, although not quite so high, is double the circuit of the former. These mounds bear some resemblance to the pyramids of Babylon, with this difference, that instead of being made entirely of brick, they are formed of clay and pieces of tile, with irregular layers of brick and mortar, five or six feet thick, to serve, as it should seem, as a kind of prop to the mass. Large blocks of marble, bearing hieroglyphics, are not unfrequently discovered here by the Arabs, when digging in search of hidden treasure; and at the foot of the most elevated of the pyramids stands the "tomb of Daniel," a small, and apparently a modern building, erected on the spot where the relics of that prophet are believed to rest.

These ruins, according to major Rennell, represent the celebrated city of Sufa; but another distinguished oriental geographer controverts this opinion, and maintains that Shuster, and not Shus, occupies the situation of the ancient metropolis of the East. The arguments alleged by major

Rennell in favour of his opinion are, 1st, the similarity of name, and the situation, which agrees better with the distance between Sardis and Sufa, mentioned in the tablets of Aristagoras, than that of Shuster; 2dly, the legend of the prophet Daniel, whose coffin was found at Shus; and 3dly, that Sufa ought to be placed on a river, which has its source in Media. Dr. Vincent, in reply, says, that the similarity of name is a corroborating circumstance, when we are sure of our position. But till the position be ascertained, it is only a presumptive proof, and often fallacious; and that Shuster approaches still nearer than Shus to Shushan, which is its title in Scripture, and Shushan differs not from Sufa, but by the insertion of a dot in the letter *Schin*. To the legendary tradition of the tomb of Daniel, little more respect is due, as the learned doctor conceives, than to the legends of the church of Rome and the Mahomedan traditions. Sufa, he adds, was on the river Euleus; Shuster is more ancient than Shus; Sufiana, the name of the province, approaches nearer to Shushan; and Kuzistan, its modern appellation, derived from the mountains which surround it, is evidently connected with the Kifii, Kussi, and Kossii of the Greeks. Nearchus failed up to Sufa, without entering the Shat-ul-Arab, which he would not have done, if that city had stood on the Kerah; and when Alexander descended the Euleus, he sent his disabled ships through the cut of the Hafar, into the Shat-ul-Arab; and, finally, a strong reason for placing Sufa at Shuster occurs in Ebn Haukul, who says, that there is not in all Kuzistan any mountain, except at Shuster, Jondi Shapour, and Ardz; and as the cattle of Sufa is represented by historians as a strong place, it is reasonable to suppose that it stood upon a hill. Mr. Kinneir, in his "Geographical Memoir on the Persian Empire," has examined with critical skill and great candour the objections of Dr. Vincent, and the principles on which they are founded; and the result is, that he inclines to favour the opinion of major Rennell, in support of which he cites the authority of Strabo, who says, that the Persian capital was entirely built of brick, there not being a stone in the province; whereas the quarries of Shuster are very celebrated, and almost the whole of the town is built of stone, but there is no such thing in the environs of Shus, which was anciently formed of brick, as appears from our author's description of the pyramids that still remain. However the question concerning the site of the city of Shus be determined, it is now a gloomy wilderness, infested by lions, hyænas, and other beasts of prey.

SHUSJIMIAN, a town of Persia, in Khorassan; 6 miles N. of Maru.

SHUSTER, a province or district of the Persian empire, constituting one division of Kuzistan, or Chufistan, the other being formed by the territories of the Chab Sheikh. The latter extend from the banks of the Tab to the conflux of the Karoon and Abzal, and from the shore of the Persian gulf to a range of hills which skirt the valley of Ram Hormuz to the south. The most fertile spots in this district are those in the environs of Dorak, the capital of the Chab prince, and on the banks of the Hafar and Shat-ul-Arab. Here dates and rice are produced; and hence the Sheikh Mahomed derives his principal revenues. The wheat and barley that are grown are scarcely sufficient for the supply of the inhabitants. The rice harvest is in August and September, and that of other grain in April and May. The northern and western parts of the country afford tolerable pasturage; and here the wandering tribes, which compose the principal part of the population, pitch their tents. Both banks of the Karoon, from its junction with the Abzal, eight furlongs below Shuster, to the ruins of

Sabla, are uninhabited, and consequently almost wholly uncultivated, and covered with brush-wood, the resort of lions, wild bears, and other animals. Morasses are common. The Chab country is watered by three rivers, *viz.* 1st, the Karoon, supposed by some geographers to be the ancient Choaspes, but Kinneir disputes their identity; it rises 22 furlongs S.W. of Isfahan, and after receiving many tributary streams in the mountains of Lauristan, flows through the city of Shuster to the village of Bundekeel, eight furlongs to the S. of that city, where it meets the Abzal: pursuing thence a southerly course, as far as Sabla, N. lat. $30^{\circ} 32'$, and 30 miles E. of Bassora, it divides itself into two branches, one of which discharges itself into the sea at Goban, and the other, assuming the name of Hafar, separates, after a course of 14 miles, into two branches, one of which passes through an artificial canal, three miles in length, into the Shat-ul-Arab, and the other enters the sea by the name of the Bamishire. 2dly. The *Tab*, which see; and the 3d is the Jerahi, or ancient Pasitigris, which descends from the mountains behind Bebahan, in the province of Fars, and passing within a few miles of the walls of that city, runs through the vale of Ram Hormuz to old Dorak, in the territory of the Chab Sheikh. Here it is dispersed in various directions for the purpose of agriculture; and the water afterwards is lost, or occasions the vast morasses in the vicinity of modern Dorak. The principal towns in the district of Chab Sheikh are, Dorak or Felahi, Ahwaz, Endian, Mashoor, Goban, and Jerahi, whence the river, so called, derives its name. The revenues of the Chab Sheikh amount to five lacs of piastres, or about 50,000*l.* sterling a-year; and he can bring into the field 5000 horse, and 20,000 foot.

The territories attached to the government of Shuster constitute the fairest portion of Sufiana. It derives its fertility from four noble rivers, and from a multitude of smaller streams. This wealthy province, which, according to Strabo, yielded to the husbandman 100 or even 200 fold, and was rich in its productions of cotton, sugar, rice, and grain, is now, for the greatest part, a forsaken waste. The only indications to the contrary occur between Bundekeel, Dezphoul, the vicinity of Haweeza, and the vale of Ram Hormuz. From the Abzal to the Tigris, and the river Gyndes, on the western side, and from the banks of the Karoon to those of the Shat-ul-Arab, all is dreary and desolate; and on the E. side of Shuster a lonely wild, upwards of 60 miles in length, extends from that city to the entrance of the valley of Ram Hormuz. Although the inhabitants of the towns and villages groan under the arbitrary sway of the governor of Shuster, his authority is hardly acknowledged by the wandering tribes, both Persian and Arabian, of Kuzistan. Of the four great rivers which embellish and fertilize the district of Shuster, Karoon deserves the first mention. Next in magnitude is the Abzal, which has two sources, one in the Shatur Koh, near Boorjird, and the other in the mountains of Lauristan: these form a junction N. of Dezphoul, and after passing under the walls of that city, empty themselves, after a winding course, into the Karoon, at Bundekeel. The third river is the Kerah, or Haweeza river, called by the Turks the Karasu, which is formed by the junction of many streams in the province of Ardelan, in Kurdistán: it runs through the plain of Kermanshaw, meeting the Kazawur and the Gamafu. The Karasu, increased in magnitude by tributary streams, flows with a furious course towards Kuzistan, and supplied with an accession of water, it passes on the W. of the ruins of Shus to the city of Haweeza, and enters the Shat-ul-Arab, about twenty miles below Korna. The

fourth river is that supposed by Mr. Kinneir to be the ancient Gyndes, which proceeds from an unknown source in the mountains of Lauristan, and joins the Tigris between Koot and Korna.

Shuster, the capital of Kuzistan, and the residence of a Béglerbeg, is situated in N. lat 32° . E. long. $48^{\circ} 59'$, at the foot of the mountains of Bucktiari, on an eminence commanding the rapid course of the Karoon, across which is a bridge of one arch, upwards of eighty feet high, from the summit of which the Persians often throw themselves into the water, without the slightest injury. On the western side it is defended by the river, and on the other side by the old stone wall, now fallen into decay. The houses are good, being principally built of stone, but the streets are narrow and dirty. The population, consisting of Persians and Arabians, exceeds 15,000 souls; and it has a considerable manufacture of woollen stuffs, which are exported to Bassora, in return for the Indian commodities brought from thence. This city is generally believed to be the ancient Susa; but some approved geographers entertain a different opinion. (See SHUS.) Shus, in the old Persian language, means pleasing, or delightful, and Shuster still more delightful; and the name is said to be given to this city by Sapor, the son of Artaxerxes Babegan, by whom it was founded, and caused to be built under the inspection of his prisoner, the Roman emperor Valerian. It was once, without question, a place of vast extent, and no inconsiderable magnitude. The castle, dyke, and bridge, are most worthy of notice. The castle occupies a small hill at the western extremity of the town, commanding a fine view of the river, mountains, and adjoining country. This fortress is, on two sides, defended by a ditch, now almost cloaked up with sand, and on the other two sides by a branch of the Karoon. It has one gate-way, formerly entered by a draw-bridge. The hill is almost entirely excavated, and formed into furdahs and subterraneous aqueducts, through which the water still continues to flow. Near the castle is the dyke, or "bund," built by Sapor across the Karoon, with a view of turning a large proportion of the water into a channel more favourable for agriculture, than that which nature had assigned it. This dyke is constructed of cut stone, bound together by clamps of iron, about 20 feet broad, and 400 yards long, with two small arches in the middle. It has lately been rebuilt by Mahomet Ali Meerza, governor of Kermanshaw, and its beneficial effects are already experienced. The artificial canal, occasioned by the construction of this dyke, disembogues, after a long winding course, into the Dezphoul, half a mile from Bundekeel. Near the canal is a bridge, built of hewn stone, consisting of 32 arches, 28 of which are yet entire. The city of Shuster is so remarkable for its salubrity, as to be the continual resort of invalids from the surrounding territories. In summer the heats are excessive from nine in the morning to the same hour at night, when the air is refreshed by a gentle breeze from the N.W. During the day the inhabitants take refuge in subterraneous chambers, and pass the night on the flat roofs of their houses. The winters are mild, and the springs temperate and delightful. Shuster affords excellent springs. Kinneir's Geog. Mem. of the Persian Empire.

SHUT in Land. See LAND.

SHUTESBURY, in *Geography*, a township of America, in Hampshire county, Massachusetts, on the E. side of Connecticut river; 90 miles W. by N. from Boston, containing 939 inhabitants.

SHUTTING, in *Anchor-Making*, denotes joining or welding one piece of iron to another.

SHUTTING-

SHUTTING-UP, in *Rural Economy*, a term applied to woods and plantations, which signifies the inclosing and securing them from the injuries which are done to them by neat cattle and other sorts of live-stock getting into them, and the keeping of them secure and safe for a certain period of time before they are cut over and converted to use in their different intentions. See **WOOD**.

It also implies the removing of live-stock from the pastures and other grafs lands, for the purpose of closing them in the view of having the former of a more full, suitable, and better growth or bite, as it is called, and the latter more productive of grafs for hay. See **MEADOW**, and **PASTURE**.

SHUTTLE, in the *Manufactures*, an instrument used by the weavers, which, with a thread it contains, either of woollen, silk, flax, or other matter, serves to form the woofs of stuffs, cloths, linen, ribbands, &c. by throwing the shuttle alternately from left to right, and from right to left, across between the threads of the warp, which are stretched out lengthways on the loom.

In the middle of the shuttle is a kind of cavity, called the *eye* or *chamber* of the shuttle; in which is inclosed the spool, which is a part of the thread destined for the woof; and this is wound on a little tube of paper, rush, or other matter.

The ribband-weaver's shuttle is very different from that of most other weavers, though it serves for the same purpose: it is of box, six or seven inches long, one broad, and as much deep; shod with iron at both ends, which terminate in points, and are a little crooked, the one towards the right, and the other towards the left, representing the figure of an ∞ horizontally placed.

SHUTTLE, in *Inland Navigation*, a term expressing a small sluice, paddle, &c.

SHUTTLEWORTH, **OBADIAH**, in *Biography*, organist of St. Michael's church, Cornhill, was elected, on the resignation of Harte, for St. Dione's Back-church, who was succeeded by Burney in 1749. Shuttleworth, soon after his election at St. Michael's, was appointed one of the organists of the Temple church. He was the son of Shuttleworth of Spitalfields, the father of a remarkable musical family, and had acquired a small fortune by teaching the harpsichord, and transcribing the compositions of Corelli, before they were printed in England. He had three sons and a daughter, all good musicians; and had frequent concerts at his house for the amusement of his friends, in which the sons played the violin and tenor, the daughter the harpsichord, and the old gentleman the viol da gamba. His son Obadiah, particularly, was so admired a performer on the violin, as to be ranked among the first masters of his time. He led the band at the Swan concert, from its first institution to the time of his death, about the year 1735, when he was succeeded by Festing. His brothers were excellent performers on the violin, and employed in all the city concerts. But Obadiah is almost a single instance of the same musician being equally admired for his performance on two different instruments. He was such a favourite player on the Temple organ, that great crowds went thither to hear him of a Sunday evening, when, after service, he frequently played near an hour, giving a movement to each of the solo stops previous to his final fugue on the full organ.

SHWAN-PAN, the name of a Chinese instrument, composed of a number of wires, with beads upon them, which they move backwards and forwards, and which serves to assist them in their computations. See **ABACUS**.

SHWAYEDONG, in *Geography*, a small but neat town of the Birman empire, on the Irawaddy, containing about

300 houses, ranged in a regular street; each dwelling having a small garden, fenced with a bamboo railing. Its two monasteries and a few small temples did not engage the particular notice of Col. Symes and his companions; but the tall and wide-spreading trees that overshadowed them were objects of pleasing contemplation. Symes's *Embassy to Ava*, vol. ii. p. 254.

SHY, in *Agriculture*, a provincial term, signifying high-mettled or head-strong, in the manner of wild colts, &c.

SHYAMULA, in *Mythology*, a name of Parvati, the consort of the Hindoo deity Siva. It means with a blue body; and is, with many other names of similar derivation, given to that goddess, and to Vishnu, Krishna, and Rama, who are described and represented of "hyacinthine hue." Among these names are Syama, Shyamala, &c.

SI, in *Geography*, a town of China, of the third rank, in Ho-nan; 50 miles N.W. of Kouang.

SI, or **SIA**, a town of China, of the second rank, in Chan-si. N. lat. $36^{\circ} 40'$ E. long. $110^{\circ} 31'$.

SI, in *Music*, a name in singing, given by the French to the sharp 7th of the key of C, to preclude the embarrassment of the mutations in solmification. (See **HEXACHORD**, and **MUTATIONS**.) A similar expedient had been often attempted by various authors; but none had been so generally adopted as this, which however was long solely confined to France; nor is it yet general all over Europe. And we think that the manner in which the French syllabize not only vocal but instrumental music, is subject to very material objections; it only provides for one key. If the new syllable *fi* had been used for the sharp 7th of every key, as well as that of *ut* or C natural, and *la* for every key-note or *tonique* in minor keys, it would have exempted the *principianti* in singing from much perplexity. There is no certain name for any note, except in the key of C, *ut, re, mi, fa, sol, la, si, ut*; and whether B is flat, natural, or sharp, it is equally denominated *fi*; as C, whether natural, flat, or sharp, is always called *ut*. When D is the key-note, it is named *re*; when it is the 3d of the key of Bb, or 4th of A, it still retains the name of *re*.

Malcolm, in the year 1721, was the first who openly censured the hexachords, which Dr. Pepusch, in 1731, defended with some warmth, by giving the best and clearest explanation of their use and importance, not only in singing but composition, in regulating the answers to fugues. Fouchs, Padre Martini, Sala, and the most respectable Italian and German theorists, still adhere to the solmification which has produced so many great composers and singers during the two last centuries. We have given our opinion fully on the subject in the article **SERRA**, a Roman master, who proposed a new method of naming the intervals in cultivating the voice. See **SERRA**.

The original introduction of this syllable is attributed by Merfennus and other writers to one Le Maire, a French musician, who laboured for thirty years to bring it into practice; but he was no sooner dead than all the musicians of his country made use of it. However, it has been the more general opinion, that the syllable *fi* was introduced into the scale by Ericius Puteanus of Dort, who lived about the year 1580. M. Bourdelot ascribes the introduction of this syllable into the scale to a Cordelier, about the year 1675; and he adds, on the testimony of the abbé de la Louette, that it was invented, or a second time brought into practice, by one Metru, a famous singing-master at Paris, about the year 1676; and Bonet inclines to think, that the honour of the invention might be due to the Cordelier, but that the merit of reviving it is to be ascribed to Metru. Bourdelot insinuates, that though the use of the syllable *fi* is much ap-

proved of by the French musicians, yet in Italy they disdain to make use of it, as being the invention of a Frenchman. Hawkins's Hist. of Music, vol. i. p. 435.

The French are not yet agreed to whom they are obliged for the syllable *fi*; some say it was Nevers, some Le Maire, and other claimants are mentioned by Rousseau; but not being quite satisfied with its utility, we shall bestow no pains in verifying the claims of an imperfect invention.

Si Action, in *Law*, the conclusion of a plea to the action, when the defendant demands judgment, if the plaintiff ought to have his action, &c.

SIABE', in *Geography*, a town of Persia, in the province of Segestan, or Seistan.

SIABISCH, a river of Russia, which runs into the Abakan, near Bankalova, in the government of Kolyvan.

SIADY, a town of Samogitia, seated on a lake; 33 miles N.N.W. of Miedniki.

SIAGNE, a river of France, which runs into the Mediterranean, N. lat. $43^{\circ} 31'$. E. long. 7° .

SIAGONAGRA, a name given by some medical writers to the gout in the jaws.

SIAKA, in *Geography*, a town of Japan, in the island of Kimo; 12 miles W. of Taifero.

SIA-KOH, a mountain of Persia, in the province of Irak; 50 miles E.N.E. of Kom.

SIAL, a small island near the coast of Egypt, which forms a harbour in the Red sea. N. lat. $24^{\circ} 30'$. E. long. $35^{\circ} 2'$.

SIALACOORY, a town of Hindoostan, in Cochin; 30 miles N.E. of Cranganore.

SIALISMUS, formed from *σάλιον*, *saliva*, a word used by the ancients to express a discharge of saliva, brought on by the holding hot things in the mouth; and by us for a salivation by mercury.

SIALO, in *Geography*, a town on the E. coast of the island of Sibiu. N. lat. $9^{\circ} 53'$. E. long. $123^{\circ} 30'$.

SIALOCHI, a term used by the ancients to express such persons as had a plentiful discharge of saliva, by whatever means. Hippocrates uses it for a person having a quinsy, who discharges a very large quantity of saliva. Others express by it persons, whose mouths naturally abound with a bitter saliva; and others, such persons as, from having a very large tongue, spit into people's faces while talking with them.

SIALAGOGUES, in *Medicine*, from *σάλιος*, *saliva*, and *αγω*, *I excite*, comprehend all such medicines as increase the flow of saliva.

The substances which operate upon the salivary glands, so as to excite them to pour out their fluid in increased quantities, are of two kinds; namely, those which may be called external, and which, when applied within the mouth, stimulate the excretories of saliva and mucus, opening thereby their acrid qualities; and those which are administered internally, and operate through the medium of the circulation.

It seems to be a salutary provision of nature, that when any acrid matter is applied to the sensible parts of the tongue and internal surface of the mouth, a quantity of saliva and mucus should be poured out to wash it off, or to defend those parts from its irritating effects. Whence, by the continued application of acrid substances, a considerable evacuation of the vessels of those parts is produced. By emptying the salivary glands and mucous follicles, they produce an afflux of fluids from all the neighbouring vessels to a considerable extent. Whence it will be readily understood, that these masticatories may relieve rheumatic congestions, not only in the neighbouring parts, as in the case of tooth-ache, but also

congestions or inflammatory dispositions in any part of the head, supplied by the branches of the external carotid.

Many substances are resorted to for this purpose, and chiefly the warm and acrid vegetables; indeed every substance that proves sharp and heating to the tongue, or internal surface of the mouth, will answer the end. The angelica is a mild and agreeable sialagogue; the imperatoria more acrid; and the pyrethrum more acrid still, and therefore more commonly employed. Other substances might be enumerated, but it may be enough to add, that a bit of fresh horse-radish root, held in the mouth, and chewed a little there, is as effectual as any.

The only medicine which we possess, that is capable of exciting a flow of saliva when taken internally, is *mercury*. In its crude and simple state of quicksilver, however, it is perfectly inert, and exerts no influence whatever upon the living body, until it is oxydated, or combined with other materials. Its operation then, as Dr. Cullen has ably demonstrated, is not, as was formerly supposed, by any chemical action on the fluids of the body, by which they are attenuated, and thus made to pass off more readily through the excretory ducts; but by a general stimulant effect upon the vascular system, and especially upon the various excretories of it. When blood is drawn from a person under the full influence of mercury, it exhibits no appearance of any diminution of consistence; but, on the contrary, it is always found in the same condition as in inflammatory diseases.

It will not be necessary to enter into detail in this place respecting the mode of administering mercury as a sialagogue, since that has already been done under the head of *LUES Venerea*, for which disease principally it is so exhibited. In this disease, indeed, as well as in diseases of the liver, in hydrocephalus, and some other maladies, it is not administered with a view to the evacuation from the salivary glands; its operation as a sialagogue is rather looked upon as the test of its full influence on the constitution, than as the means of its remedial power. See Cullen, *Materia Medica*, part ii. chap. 17.

During the prevalence of a chemical theory, to which the discovery of the importance of oxygen in the animal economy gave rise, and when it was supposed that the nitric acid had been found to be a substitute for mercury in the cure of syphilis, it was even maintained that this acid acted in a similar manner upon the salivary glands, and was, in fact, a powerful sialagogue. Farther experience, however, while it disproved the antivenereal powers of this acid, disproved also its virtues as a sialagogue, except indeed it might influence the excretory ducts of the glands externally, that is by its acrid qualities in the act of being swallowed.

SIALUSSIEB, in *Geography*, a town of the Arabian Irak, on the Euphrates; 8 miles E. of Sura.

SIAM, a country of Asia, the name of which is of uncertain origin; but probably derived from the Portuguese, in whose orthography Siam and Siao are the same; so that Sian, or Siang, might be preferable, as Loubere has suggested, to Siam; and the Portuguese writers in Latin call the natives "Siones." The Siamese style themselves "Tai," or freemen, and their country "Meuang Tai," or the kingdom of freemen. The Portuguese might possibly derive the name Siam from intercourse with the Peguese. "Shan," however, is the oriental term. Before the recent extension and encroachments of the Birman empire, the rich and flourishing monarchy of Siam was regarded as the chief state of exterior India; but some of its limits are not now easily ascertained. On the west of the Malayan peninsula some few possessions may remain to the south of Tanaserim; and on the eastern side of that Chersonese, Ligor may

may mark the boundary. On the west, a chain of mountains divides Siam, as formerly, from Pegu; but the northern province of Yunshan seems to belong to the Birmans; who extended their territory, in this part, to the river Maykang; and the limits may perhaps (says Pinkerton) be a small ridge running E. and W. above the river Anan. To the S. and E. the ancient boundaries are fixed; the ocean, and a chain of mountains, dividing Siam from Laos and Cambodia: so that, according to the ancient description of this kingdom, it may be considered as a large vale between two ridges of mountains. The northern boundaries, as defined by Loubere, evince that Siam has lost little in that quarter. His city Chiámai is probably Zamce, fifteen days' journey beyond the Siamese frontier. The northern limit is therefore at 19° , and not at 22° , as he erroneously states its latitude; and therefore the length of the kingdom may be about 10° , or near 700 British miles, and about one-half of this not above 70 miles in medial breadth. Or its admeasurement may be more accurately stated from about 11° of N. lat. to 19° ; being in length of about 550 British miles, by a breadth of 240.

This kingdom is divided into ten provinces, *viz.* Suphia, Bancok, Porcelon, Pipli, Camphine, Rappri, Tanaserim, Ligor, Cambouri, and Concacema, each of which has its governor respectively. Of these provinces we have the following short notices. Bancok is situated above seven leagues from the sea, and in the Siamese language is called Fou. Its environs are embellished with delicious gardens that furnish the natives with fruit, which is their chief nourishment. See BANCOK.

Tanaserim is a province abounding in rice and fruit-trees; it has a safe and commodious harbour, admitting vessels of all nations; and in this province the people find more ample resources of subsistence than in the other parts of the monarchy. (See TANASERIM.) Cambouri, on the frontiers of Pegu, carries on a considerable trade in the commodity called by the French eagle-wood, elephants'-teeth, and horns of the rhinoceros. The finest varnish is also procured from his province. Ligor affords a kind of tin, called by the French calain, the calin of the Portuguese. (See LIGOR.) Porcelon was formerly a distinct sovereignty, and produces lyeing woods and precious gums.

The capital city of the kingdom has been called Siam, by the ignorance of Portuguese navigators. In the native language the name approaches to the European enunciation of Juthia, or Juthia; it is situated on an isle formed by the river Meinam or Menam. Its walls in Loubere's time were extensive; but not above a sixth part was inhabited. Its condition, since it was delivered from the Birman conquest in 1766, has not been described. The royal palace was on the north, and on the east there was a causeway, affording the only free passage by land. Distinct quarters were inhabited by the Chinese, Japanese, Cochinchinese, Portuguese, and Malays. The temples, pyramids, and royal palaces seem to have been much inferior in all respects to those of the Birmans. See JUTHIA.

The other chief towns in the Siamese dominions are Bancok, at the mouth of the Meinam, Ogmo, and others on the eastern coast of the gulf of Siam. On the western, D'Anville marks Cham, Cini, and others as far as Ligor. Along the banks of the great river are Louvo and Porseouc, with others of inferior note. Louvo was a royal residence for a considerable part of the year. In general, these towns were only collections of hovels, sometimes surrounded with a wooden stockade, and rarely with a brick wall. In the south-west, Tanaserim and Merghi may be regarded as possessions belonging to the Birman empire, and the remain-

ing fragment of the Siamese territory in that quarter presents no considerable town; though villages appear in Junkfeylon and some of the other isles. Kämpfer, in an account of his voyage to Japan in 1690, describes two remarkable edifices near the capital: the first is a famous pyramid, and called Puka Thon, erected for the commemoration of a victory obtained, on the spot where it stands to the N.W., over the king of Pegu. This magnificent structure is enclosed by a wall, and is 120 feet high, varying in form at its different stages, and terminating in a slender spire; the second edifice consists of two squares to the east of the city, surrounded by a wall, and separated by a channel of the river. These squares contain many temples, convents, chapels, and columns, particularly the temple of Berklam, with a grand gate ornamented with statues and various carvings; the other decorations appear by Kämpfer's account to have been exquisite.

Our principal sources of information with regard to Siam are the publications of La Loubere, who went as ambassador from Louis XIV. to the king of Siam, and those of the French missionaries, of which, that from the papers of the bishop of Tabraca by Turpin, in 1771, is the most important. According to the account of the latter writer, the people of Laos and Pegu have established a considerable colony in Siam, since their countries were ravaged by the Birmans. Here are also many Malays, and the ancient kings had a guard of Japanese, which exhibits, in a striking point of view, the intercourse that subsisted among oriental nations.

With regard to the history of Siam, we shall content ourselves with observing, that previously to the Portuguese discoveries, this country was unknown to Europeans. According to Loubere's account, the first king of the Siamese commenced his reign in the year 1300 of their epoch, or about 756 years after the Christian era. Since the Portuguese discovery, their wars with Pegu, and occasional usurpations of the throne, constitute the principal topics of their history. In 1568 the Peguese king declared war on account of two white elephants, which the Siamese refused to surrender: and after prodigious slaughter on both sides, Siam became tributary to Pegu: but about the year 1620, raja Hapi delivered his crown from this servitude. In 1680, Phalcon, a Greek adventurer, being highly favoured by the king of Siam, opened an intercourse with France, for the purpose of supporting his ambitious designs; but they were punished by his decapitation in 1689, and the French connection was thus terminated. From Turpin, who has extended the history of Siam to the year 1770, we learn, that the first king began to reign about 1444 years before Christ, and that he had forty successors before the epoch of the Portuguese discovery, or the year 1546, many of whom were precipitated from the throne on account of their despotism. Nevertheless, as these forty kings cannot be supposed to have reigned more than ten years each, at a mean computation, the first historical date cannot ascend beyond the year 1100 after Christ, instead of 1444 years B.C. One of the most remarkable events, after the French had evacuated Siam, is the war against the kingdom of Cambodia, which was reduced to the necessity of seeking the protection of Cochinchina. The Siamese army, having advanced too far into the country, was destroyed by famine; and their fleet, though it destroyed the town of Ponteamas, with 200 tons of elephants' teeth, had little success. In 1760 a signal revolution happened in Siam, preceded by violent civil wars between two rival princes. According to Turpin's statement, the Birmans, a people of the kingdom of Ava, had, in 1754, languished five years under the Peguese domination. Having lost by death their

their king, queen, and most of their princes, they lamented their humiliation and servitude, and anxiously sought for a deliverer. With this view they selected one of their companions, named Manlong, a gardener, who, singularly qualified for the office they devolved upon him, by corporeal and mental endowments, undertook to rescue them from the yoke of tyrants, on condition of their cutting off the heads of all the little subaltern tyrants whom the Peguese had sent to oppress them. They readily submitted to his terms; and after the massacre, Manlong was proclaimed king. Having prepared a force, and established a discipline which rendered the Birmans almost invincible, he began by the capture and complete ruin of the city and port of Siriam, which took place about the year 1759; and advancing to Martavan and Tavai, the new monarch received information of the riches of Siam, and formed the design of its conquest. He began by sending 30 ships to pillage the cities of Merghi and Tanaferim, and this success led him to flatter himself that he should be able, with great ease, to subdue the whole kingdom of Siam. The court of Siam, hearing of this irruption, sent to the bishop of Tabraca, to request that he would arm the Christians, who amounted only to the number of 100, and yet acquitted themselves with greater honour than the pusillanimous multitude. The Birman sovereign, being at the distance of three days' march from Yuthia, the capital, died in consequence of an abscess. The suburbs, however, on the Dutch quarter were ravaged and burnt; and the surrounding country was exposed to a thousand cruelties. The death of Manlong delivered the Siamese capital; the youngest of his sons having assumed the sceptre, found himself under the necessity of regaining his own kingdom, in order to stifle any revolt. The Siamese sovereign, however, having rashly pronounced a sentence of death against the favourite of his brother, was forced to abdicate the throne; and in consequence of this event he became a Talapoin, or monk, in May 1762, and many of his nobles followed his example. Siam remained in a state of security, upon the report that the new prince of the Birmans had been dethroned upon his return to Ava; and that his elder brother, who had succeeded, had no wish to make conquests. This pacific monarch dying suddenly, a pretence of war was afforded by the assistance which the Siamese had given to a rebel Birman governor. In January 1765, the Birmans attacked Merghi and took it; and then proceeded to Tanaferim, which they reduced to ashes. Flushed with success, the general of the Birmans marched against Yuthia, not doubting that the conquest of the capital would induce other cities to submit. The provinces on the north-west of the royal city were ravaged; and the inhabitants saved themselves from death or slavery by dispersion into forests, where they participated the food of wild beasts. The Siamese, threatened with speedy and total destruction, reunited their forces; but though they fought with ardour, their sanguinary defeat subjected their country to the power of their conqueror. The fields, ravaged by the consuming flames, presented nothing to them but ashes, and famine became more terrible than war. The victorious Birmans built, at the confluence of two rivers, a town, or rather a fortified station, which they called Michoug. The Siamese, on their part, attempted to fortify the capital, and earnestly solicited the assistance of two English vessels which happened to arrive. The captain of one of them consented to defend the capital, on condition of being supplied with cannon and ammunition: but the jealous Siamese insisted that he should first lodge his merchandizes in the public magazine. With this condition he complied, and going on board his ship, harassed the enemy, and destroyed their forts, so that every day was

marked either by their defeat or flight. But demanding more ammunition, the daftardly court became afraid, that the English captain, with his single ship, would conquer this ancient monarchy. Its indignant captain withdrew, after seizing six Chinese vessels, whose officers received from him orders upon the king of Siam to the amount of the merchandizes which had been lodged in the public treasury. Upon his retreat, the Birmans, finding no opposition, spread universal desolation, and consigned even their temples to the flames. Instead of recurring to arms, the superstitious monarch and his ministers reposed their whole confidence in their magicians. A Siamese prince, indeed, who had been banished to Ceylon, raised a little army, and returned to the assistance of his country; but the distracted court of Siam sent forces to oppose their deliverer. Many of the Siamese, justly provoked by this conduct, joined the Birmans, who in March 1766 again advanced, after having been repulsed by the English captain, to within two leagues of the capital. In September 1766, the Birmans seized a high tower, at the distance of about a quarter of a mile from the city, and raised a battery of cannon, which gave them an absolute command of the river. In this state of urgent danger, 6000 Chinese were charged with the defence of the Dutch factory, and of a large adjacent temple. The Birmans, in consequence of previous skirmishes and a subsequent assault, seized on five considerable temples, which they converted into fortresses; but in another assault they were compelled to retire. The Siamese officers, eager to secure the magazines of grain, as a future resource, produced an immediate famine; which, followed by a contagious disorder or pestilence, occasioned the most dreadful devastation. The Dutch factory was in vain defended by the Portuguese and Chinese; and after a siege of eight days, it was taken and reduced to ashes. The whole Christian quarter of the city shared the same fate; and the virgins were obliged to marry the first young men that presented themselves, in order to be protected by the matrimonial tie, which the Birmans reverence. The Birmans, demanding an unconditional surrender, assaulted the city, and captured it on the 28th of April 1767. The wealth of the palaces and temples was consumed by the flames, or abandoned to the soldiery. The golden idols were melted; and the victors, finding that their avarice had been sacrificed to their fury, recurred to acts of violation and cruelty. The great officers of the kingdom were laden with irons, and condemned to the galleys. The king, attempting to escape, was inflamed at the gate of his palace. When nothing remained for these conquerors to destroy, they resumed their march to Pegu, accompanied, among other captives, with the remaining princes and princesses of the royal blood of Siam. In June the Birmans quitted Siam, after having burnt the town of Michoug, soon after its construction.

When the Birmans evacuated their conquest, the Siamese issued from their forests, and superstitiously directed their first rage against their gods, for having abandoned them to a destructive enemy. Availing themselves of the wealth which accrued from the statues, filled by superstitious persons with gold and silver, who expected to find them when they revisited this world, they proceeded to elect a leader; and Phaia-Thaë, an officer of acknowledged ability, was the object of their choice. This new prince displayed considerable bravery and talents; and in the year 1768 suppressed a rebellion that was instigated against him. The Birmans in vain attempted to renew their incursions into the Siamese territory: they were repulsed, and afterwards obliged to turn their arms against the Chinese, who were defeated in their turn. For further particulars with regard to the history of Siam, see *BIRMAN Empire*. Indeed, if the Birman empire maintains

maintains its present extent, Siam, we can have little doubt, will ere long be deprived of its independence. But it is an event not, perhaps, less probable, that the Birman empire itself will fall into confusion, and be dismembered.

Every thing we are told respecting the government, the laws, the literature, the arts, and personal qualities of the Siamese, indicates a corresponding state of advancement with that of the Birmans. That the religion of the Siamese is the same with that of the Birmans, and derived from the same origin as that of the Hindoos, there seems to be sufficient evidence. Sommona-Codam, mentioned by Loubere as the chief idol of Siam, is interpreted by competent judges to be the same with the Boodh of Hindoostan. The sacred language called Bali is of the same origin: the most esteemed book seems to be the Vinac, and the precepts of morality are chiefly five; *viz.* not to kill, not to steal, not to commit uncleanness, not to lie, and not to drink any intoxicating liquor. Loubere has given a translation of a more minute code of morals, chiefly compiled for the use of persons dedicated to religion, whom he calls Talapoins. Their laws are said to be in high reputation all over the East; and it is not certain, whether, like those of the Birmans, they are of Hindoo, or of indigenous birth. Their system of legislation is represented by all writers on this country, as extremely severe in its sanctions; death or mutilation being punishments of unimportant offences. The Siamese imitate the Chinese in their festival of the dead; and in some other of their rites. The government of Siam is despotic, and the sovereign, as among the Birmans, is revered with honours almost divine. The succession to the crown is hereditary in the male line. The population has not been accurately ascertained, nor have we any documents for this purpose. Allowing to the Birman empire more than fourteen millions, as some have stated, the Siamese dominions may probably be peopled by about eight millions. However, Loubere assures us in his time, that from actual enumeration, there were only found, of men, women, and children, 1,900,000. Loubere says that the Siamese had no army, except a few royal guards; but Mandelsso estimated the army, which may be occasionally raised, at 60,000, with no less than 3000 or 4000 elephants. The navy is composed of a number of vessels of various sizes, which display a singular fantastic elegance, like those of the Birmans; and naval engagements frequently occur. The revenues of this sovereignty are of uncertain computation. Mandelsso describes them as arising from the third of all inheritances, from trade, conducted by royal agents, annual presents from the governors of provinces, duties imposed on commerce, and the discovery of gold, which seems to be a royal claim. Tin is also a royal metal, except that found in Junkfeylon, which is abandoned to the adventurers. Loubere adds a kind of land-tax, and other particulars, among which is the royal domain.

Siam appeared to the French, in the reign of Louis XIV. to be of considerable political importance; for this monarch was ambitious of forming permanent settlements, by rendering it a rich mart of Indian commerce. If we had any apprehension that the Birmans would become dangerous to our possessions in Bengal, our alliance with Siam might be highly serviceable. In a merely commercial point of view, as it may be difficult to preserve the friendship of both the Birmans and the Siamese, it is not easy to determine from which state superior advantages might be derived. If directed by European policy, Siam would form strict alliances with the more eastern states of exterior India, as a common defence against the growing preponderance of the Birmans.

As to the manners and customs of the Siamese, as they

have embraced a branch of Hindoo faith, they are rather Hindoostanic than Chinese; though its situation is central between the vast countries of China and Hindoostan. Loubere has given a detailed account of the Siamese manners. The females are under few restraints, and marry at an early age, and are past parturition at forty. Marriages are conducted by female mediation, and a priest or magician is usually consulted concerning the propriety of an alliance. On the third visit the parties are considered as wedded, after the exchange of a few presents, without any farther ceremony, civil or sacred. Polygamy is allowed, more from ostentation than any other motive; and one wife is always acknowledged as supreme. Royal marriages, from considerations of pride, are sometimes incestuous; nor does a king hesitate to espouse his own sister. Divorce is seldom practised; but the rich may choose a more compliant wife without dismissing the former. Few women become nuns, till they are advanced in years. The Siamese funerals resemble those of the Chinese. On this occasion, the Talapoins sing hymns in the Bali tongue. After a solemn procession the body is burnt on a funeral pile of precious woods, erected near some temple; and the magnificence of the spectacle is enhanced by theatrical exhibitions, in which the Siamese are said to excel. The tombs are pyramidal, and those of the kings are large and lofty. The common food of the Siamese consists of rice and fish; they also eat lizards, rats, and several kinds of insects. The buffaloes yield rich milk; but butter would melt and become rancid; and cheese is unknown.

In Siam little animal food is used; the mutton and beef being very bad. The doctrine of Boodh inspires the Siamese with horror at the effusion of blood. The houses are small, and constructed of bamboos, upon pillars, in order to guard against inundations, which are common. The palaces only exceed common habitations by occupying a wider space, and being constructed of timber, with a few ornaments. They are also more elevated, but have never more than one floor. With regard to their persons, the Siamese are rather small, but well made. The figure of the countenance, says Kæmpfer, both of men and women, has less of the oval than of the lozenge form, being broad, and raised at the top of the cheeks; and the fore-head suddenly contracts, and is almost as pointed as the chin. Their eyes, rising towards the temples, are small and dull; and the *white* is commonly completely yellow. Their cheeks are hollow; mouth very large, with thick pale lips, and teeth blackened by art; the complexion coarse, brown mixed with red, to which the climate greatly contributes. From this description the Siamese appear to be much inferior in personal appearance to the Birmans; and to approach rather to the Tartaric or Chinese features.

The dress of the Siamese is slight, clothes being rendered almost unnecessary by the warmth of the climate. A muslin shirt, with wide sleeves, and a kind of loose drawers, are almost the only garments of the rich, a mantle being added in winter, and a high conic cap upon the head. The women use a scarf instead of the shirt, and the petticoat is of painted calico; but with this slight dress they are extremely modest.

The Siamese are said to excel in theatrical amusements; the subjects being taken from their mythology, and from traditions concerning their ancient heroes. Their ordinary amusements consist of races of oxen, and those of boats, the combats of elephants, cock-fighting, tumbling, wrestling, and rope-dancing, religious processions, illuminations, and beautiful exhibitions of fire-works. The men are generally very indolent, and fond of games of chance; while
the

the women are employed in works of industry. Although the Siamese are indolent, they are ingenious, and some of their manufactures deserve praise; nevertheless, the ruinous and despotic avarice of the government crushes industry by the uncertainty of property. They are little skilled in the fabrication of iron or steel, but excel in that of gold, and sometimes in miniature painting. The common people are mostly occupied in procuring fish for their daily food, while the superior classes are engaged in a trifling traffic.

The language of the Siamese, called "T'hay," according to Dr. Leyden's account of it (*Asiatic Researches*, vol. x. p. 244.), appears to be in a great measure original; but there is reason to conjecture, that it is not different from that of the Birmans. To this purpose it is alleged, that Siamese dramatists used to perform in the Birman dominions, which is not probable, unless the language were common. Dr. Leyden says, that it is more purely monosyllabic, and more powerfully accented, than any of the Indo-Chinese languages. It certainly is connected, in some degree, with some of the Chinese dialects; especially the Mandarin or Court language, with which its numerals, as well as some other terms, coincide, but these are not very numerous. It borrows words freely from the Bali, but contracts and disguises more the terms which it adopts, than either the Ruk'heng or the Barma. In its finely modulated intonations of sound, in its expression of the rank of the speaker, by the simple pronouns which he uses, in the copiousness of the language of civility, and the mode of expressing esteem and adulation, this language resembles the Chinese dialects, with which also it coincides more nearly in construction than either Barma or Ruk'heng. Its construction is simple and inartificial, depending almost solely on the principle of juxtaposition. Relative pronouns are not in the language; the nominative regularly precedes the verb, and the verb precedes the case which it governs. When two substantives come together, the last of them is for the most part supposed to be in the genitive. This idiom is consonant to the Malayu, though not to the Barma or Ruk'heng, in which, as in English, the first substantive has a possessive signification. Thus, the phrase, *a man's head*, is expressed in Barma and Ruk'heng, by *lu-k'haung*, which is literally *man-head*; but, in Siamese, it is *kua-khon*, and in Malayu, *kapala orang*, both of which are literally *head-man*. A similar difference occurs in the position of the accusative with an active verb, which case in Barma and Malayu generally precedes the verb, as *tummaing cha*, literally *rice eat*; but in Siamese follows it, as *ken kaw*, literally *eat rice*, which corresponds to the Malayu, *makan nasi*. The adjective generally follows the substantive, and the adverb the word which it modifies, whether adjective or verb. Whenever the name of an animal, and, in general, when that of a species or class, is mentioned, the generic, or more general name of the genus to which it belongs, is repeated with it, as often happens in the other monosyllabic languages, as well as in the Malayu. In the position of the adverbial particle, the Malayu often differs from the Siamese; as *Mana pargi*, literally *where go*, but in Siamese, *pai hnei*, *go where*. The Siamese composition is also, like that of the Barma, a species of measured prose, regulated solely by the accent and the parallelism of the members of the sentence; but in the recitative the Siamese approaches more nearly to the Chinese mode of recitation, and becomes a kind of chaunt, which different Brahmins assured Dr. Leyden is very similar to the mode of chaunting the Samaveda.

The T'hay coincides occasionally, even in simple terms, both with the Barma and Malayu; but these terms bear so

small a proportion to the mass of the language, that they seem rather the effect of accident or mixture, than of original connection.

The T'hay or Siamese alphabet differs considerably in the power of its characters from the Bali; though it not only has a general resemblance to it in point of form, but also in the arrangement of the character. The vowels, which are twenty in number, are not represented by separate characters, but by the character corresponding to the short *akar*, variously accented; excepting the vocalic *ru* and *lu*, which are only variations of the *r* and *l* consonants. The consonants are thirty-seven in number, and are not arranged by the series of five, like the Deva-nagari and Bali, but the first series, *ka*, consists of seven letters; the second series, *cha*, of six; the third series, *ta* or *da*, of six; the fourth series, *ba* or *pa*, of eight; the fifth series, *ja*, of four; and the last series, *sa*, of six, including the vocalic *akar*, though two of them are not in common use. Each of these letters is varied by sixteen simple accentuations, and by thirty-six complex ones. The letters *ka*, *nga*, *ta*, or *da*, *na*, *ma*, *ba* or *pa*, are also final consonants. Hence it is easy to perceive the near approximation of the Siamese to the delicacy of the Chinese accentuation; while in other respects, the alphabet is considerably more perfect, than in the Mandarin or Court language of the Chinese, which has neither the same variety of consonants, nor admits so many, in the close of a syllable. The Siamese pronunciation, even of consonants, corresponds very imperfectly to the European mode: *r* and *l* are generally pronounced *n* in the close of a syllable; *h* is often prefixed to a consonant; but from the total suspension of the voice in pronouncing syllables which terminate in a consonant, no aspiration can be pronounced after them; *ma* and *ba*, *tya* and *chya*, are often difficult to be distinguished in pronunciation, as are *ya* and *ja*, *kyé* and *chyé*, with other combinations. From this circumstance, many combinations of letters are pronounced in a manner somewhat different from that in which they are written.

The first European who attempted the study of Siamese literature, was the learned Gervaise, but his lucubrations have never been published. The learned and indefatigable Hyde procured from the Siamese ambassador at London, an imperfect copy of the Siamese alphabet, which has been published by Greg. Sharpe, in the "*Syntagma Dissertationum*," 1767. It is inferior to La Loubere's alphabet in accuracy, though it contains a greater number of compound characters. La Loubere's alphabet contains three forms of the *sa*, corresponding to the Nagari; but the *sha* and *sb'ba*, being disused in common pronunciation, are commonly omitted both in the alphabet and in modern MSS.

The Siamese or T'hay language contains a great variety of compositions of every species. Their poems and songs are very numerous, as are their Cheritras, or historical and mythological fables. Many of the Siamese princes have been celebrated for their poetical powers, and several of their historical and moral compositions are still preserved. In all their compositions, they either affect a plain simple narrative, or an unconnected and abrupt style of short, pithy sentences, of much meaning. The books of medicine are reckoned of considerable antiquity. Both in science and poetry, those who affect learning and elegance of composition, sprinkle their style copiously with Bali. The laws of Siam are celebrated all over the East, and La Loubere has mentioned three works of superior reputation, the *Pra-Tam-non*, the *Pra-Tam-Ra*, and the *Pra-Raja-Kam-manot*. Of these, the first is a collection of the institutions of the ancient kings of Siam; the second is the constitutional code

of the kingdom, and contains the names, functions, and prerogatives of all the officers; the third, which is about 150 years old, contains additional regulations. Of these, the first is the most celebrated and the most deserving the attention of Europeans.

The T'hay exhibits considerable variety of measures in composition, and frequently introduces several of them in the same manner as is frequently done in Bri'h, Punjabi, and Sik'h compositions. The most frequent measure, however, among the T'hay, as among the Ruk'heng and Barma, seems to be that denominated *râp*, which consists of four long syllables, but admits occasionally of one or more intercalary short ones: the Jâ-ni, which consists of five syllables, the Chô-bang of six, the Pat'hamang of seven, the Jefunta of eight, are also frequently employed. The Siamese are not deficient in literature, and their modes of education are well explained by Loubere.

From Mandellso we learn, that the commerce of the capital of Siam consisted in cloths imported from Hindoostan, and various articles from China; in exports of jewels, gold, benjoin, lacca, wax, tin, lead, &c. and particularly deer-skins, of which more than 150,000 were sold annually to the Japanese. Rice was also exported in great quantities to the Asiatic isles. The king was, by a ruinous policy, the chief merchant, and had factors in most of the neighbouring countries. The royal trade consisted in cotton cloths, tin, ivory, saltpetre, rack, and skins sold to the Dutch. A late writer informs us, that the productions of this country are prodigious quantities of grain, cotton, benjamin; sandal, aguello, and Japan woods; antimony, tin, lead, iron, load-stones, gold, and silver; sapphires, emeralds, agates, crystal, marble, and tambac. Siam, in respect of fertility, loco-position, and productive labour, possesses commercial advantages of the same nature with those of the Birman empire; but on the coast at least, the climate is far from being healthy.

The two first months of the Siamese year, corresponding with our December and January, form their whole winter; the third, fourth, and fifth, belong to that portion which is called their little summer; and the seven others to their great summer. As they lie north of the line, their winter corresponds with our's, but it is almost as warm as a French summer. The little summer is their spring; autumn is unknown in their calendar; the winter is dry, and is distinguished by the course of the wind, which almost constantly blows from the north, and is refreshed with cold from the snowy mountains of Thibet, and the bleak wastes of Mongolia.

We have already described this country as a wide vale between two high ridges of mountains; but compared with the Birman empire, the cultivated land is not above half the extent either in breadth or length. Less industrious than the Birmans, the agriculture of the Siamese does not extend far from the banks of the river, or its branches; so that towards the mountains there are vast aboriginal forests filled with wild animals, whence they obtain the skins which are exported. The rocky and variegated shores of the noble gulf of Siam, and the size and inundations of the Meinam, conspire with the rich and picturesque vegetation of the forests, illumined at night with crowds of brilliant fireflies, to impress strangers with admiration and delight.

The soil towards the mountains is parched and infertile; but on the shores of the river consists, like that of Egypt, of a very rich and pure mould, in which a pebble can scarcely be found; and the country would be a terrestrial paradise, if its government were not so despotic as to be justly reckoned far inferior to that of their neighbours the

Birmans. Rice of excellent quality is the chief product of their agriculture; wheat is not unknown; pease and other vegetables abound; and maize is confined to their gardens. The fertility of Siam depends in a great degree, like that of Egypt on the Nile, on their grand river Meinam, and its contributory streams; for an account of which, see MEINAM.

Of the lakes of this country little is known: a small one, however, lies in the east of the kingdom, which is the source of a river that flows into that of Cambodia. To its extensive ranges of mountains, inclosing the kingdom on the east and west, we have already referred. A small ridge also passes from east to west, not far north of Yuthia, called by Loubere Taramamon. The forests of the country are large and numerous, and produce many valuable woods. Its chief animals are elephants, buffaloes, and deer. The elephants in particular are distinguished for their sagacity and beauty; and those of a white colour are treated by the Siamese with a kind of adoration, as they believe the soul of such is royal. Wild boars, tigers, and monkeys, are numerous. The reports of the mineralogy of Siam are various. Mandellso, or rather his translator Wicquefort, who added, about the year 1670, the accounts of Pegu, Siam, Japan, &c. informs us, that Siam contains mines of gold, silver, tin, and copper; and Loubere suggests, that they were anciently more diligently wrought, as the ancient pits indicate; not to mention the great quantity of gold, which must have been employed in richly gilding the idols, pillars, ceilings, and even roofs of their temples. In his time no mine of gold or silver, worth the labour of being wrought, could be found. The mines chiefly wrought by the Siamese were those of tin and lead. The tin, called "calin" by the Portuguese, was sold throughout the Indies; but it was soft and ill refined. Near Louvo was a mountain of load-stone, and another of inferior quality in *Junkfeilon*; which see. Pinkerton's Geog. vol. ii.

The Siamese, though of a melancholy turn, have no objection to lively music. They have often parties on the water, which they render very pleasant by a number of voices, and the clapping of hands, with which they beat time.

The instrument in the highest favour with them produces a sound similar to two violins perfectly in tune, played at the same time. But there is nothing more disagreeable than its diminutive, the kit of this instrument, which is a kind of rebec, or violin with three brass strings.

Their copper trumpets very much resemble, in tone, the cornets with which the peasants of France call their cows. Their flutes are not much sweeter. They make likewise a kind of carillon with small bells, which are lively, and not disagreeable, when not accompanied by their iron drum, which stuns every one that is not accustomed to its noisy harshness. They have drums made of *terra cotta*, a baked clay, with a long and very narrow neck, but open at the bottom: they cover the drum with a buffalo's hide, and beat it with the hand in such a manner, that it serves for a bass in their concerts. Their voices are not disagreeable, and if we were to hear them sing some of their airs, we should not be displeased. Laborde.

SIAM, a name sometimes given to the country above described. See JUTHIA, and the preceding article.

SIAM, *Gulf of*, a large bay of the East Indian sea, between Cambodia and the peninsula of Malacca, having to the north Siam.

SIAMODEL, a town of Hindoostan, in the Carnatic; 13 miles N. of Nellore.

SIAMPA. See CHIAMPA.

SIAN, Scio, or *Cio*, a town of Africa, in Melinda.

SIANCAS, a town of South America, in the province of Tucuman; 30 miles E.S.E. of St. Salvador de Jugui.

SIANDUPADA, a town of Hindoostan, in Myfore; 13 miles S.W. of Bangalore.

SIANELLY, a town of Hindoostan, in Myfore; 13 miles S.W. of Bangalore.

SIANG, a city of China, of the second rank, in Quang-fi. N. lat. $23^{\circ} 58'$. E. long. $109^{\circ} 0'$.

SIANG-CHAN, a town of China, of the third rank, in Tche-kiang; 25 miles S.E. of Ning-po.

SIANG-HIAN, a town of China, of the third rank, in Hou-quang; 40 miles S.W. of Tchang-tcha.

SIANG-TAN, a town of China, of the third rank, in Chan-fi; 20 miles S.E. of Tfung.

SIANG-YANG, a town of Corea; 28 miles N.N.W. of San-pou.

SIANG-YANG, a city of China, of the first rank, in Hou-quang, on the river Han. N. lat. $32^{\circ} 5'$. E. long. $111^{\circ} 39'$.

SIANG-YN, a town of China, of the third rank, in Hou-quang, on the Heng river; 27 miles N.N.W. of Tcheng-tcha.

SIANKE, or SYNKE, in *Natural History*, a name given by the people of some parts of the East Indies to the caryophyllus, or clove-spice. The people of the Moluccas, according to Garcias, call it *chanque*, which is only a small difference of pronunciation. The Turks and Persians call the same spice *calafur*.

SIAO, in *Geography*, a town of China, of the third rank, in Kiang-nan; 22 miles W. of Pefu.

SIAO, an island in the East Indian sea, about 30 miles in circuit, which belongs to the sultan of Ternate. The Dutch maintain in this island a corporal, a few soldiers, and a school-master for the instruction of the children of the natives. It abounds with provisions. N. lat. $2^{\circ} 44'$. E. long. $125^{\circ} 5'$.

SIAO-CHAN, a town of China, of the third rank, in Tche-kiang; 17 miles N.W. of Chao-king.

SIAO-HE-CHAN, a small island near the coast of China. N. lat. $37^{\circ} 54'$. E. long. $120^{\circ} 34'$.

SIAO-HO-TCHAN, a town of Chinese Tartary. N. lat. $41^{\circ} 43'$. E. long. $121^{\circ} 42'$.

SIAO-NON-HOTUN, a town of Chinese Tartary. N. lat. $41^{\circ} 24'$. E. long. $126^{\circ} 50'$.

SIAO-PI-HOTUN, a town of Corea. N. lat. $40^{\circ} 24'$. E. long. $125^{\circ} 26'$.

SIAO-TEIN, a river of China, which runs into the Eastern sea, N. lat. $37^{\circ} 21'$. E. long. $118^{\circ} 44'$.

SIARA, a small town of Brasil, and capital of a district or captaincy of the same name, so called from a river which rises in the mountains, and discharges itself into the ocean in S. lat. $5^{\circ} 30'$. The captaincy is small, not being above 54 miles in compass. It has two fortresses, one on the north, joining to the town of Siara, and situated on a small hill on the right side of the haven, which is so shallow as to admit only small vessels; and the other, called Fort St. Luke, situated on the coast, at the mouth of a small river, navigable only by barks. This district abounds in cotton, sugar, tobacco, and Brasil wood, the usual staples of the country. The trade of the town, consisting chiefly of sugar and tobacco, is inconsiderable. S. lat. $3^{\circ} 15'$. W. long. $39^{\circ} 46'$.

SIARDEHUI, a town of Hindoostan, in the Carnatic; 5 miles N.E. of Udeggherry.

SIARMAN, a town of Persia, in the province of Ma-

zanderan, on the Caspian sea; 12 miles E.S.E. of Ferrabad, or *Farabat*; which see.

SIAS, a river of Russia, which runs into lake Ladoga, near Siaskoi.

SIASKOI, a town of Russia, in the government of Petersburg, near lake Ladoga; 24 miles N.E. of Nova Ladoga.

SIATGONG, a town of Hindoostan, in Bahar; 20 miles S. of Bahar.

SIATON, a town on the fourth coast of the island of Negroes. N. lat. $9^{\circ} 21'$. E. long. $123^{\circ} 3'$.

SIB, a town of Arabia, in the province of Mascot; 30 miles W.N.W. of Mascot.

SIBABA, a small island in the East Indian sea, near the fourth coast of Mindanao. N. lat. $6^{\circ} 36'$. E. long. $122^{\circ} 25'$.

SIBÆ, or SOBII, called also *Iba* or *Saba*, in *Ancient Geography*, a people of India, on this side of the Ganges, and one of the first nations that encountered Alexander on the banks of the Acesines.

SIBALD de Wert, in *Geography*. See FALKLAND Islands.

SIBALDES, a cluster of islands near the coast of Patagonia. S. lat. $50^{\circ} 53'$. W. long. $59^{\circ} 35'$.

SIBATTA, a town of Japan, in the island of Nippon; 15 miles S.E. of Nambu.

SIBAU. See SEBOU.

SIBB, a district of the Persian empire, in the province of Mekran, governed by a chief, who resides in a small town of the same name. It consists of a very extensive plain, through the centre of which flows a river, nearly dry, in the bed of which are several groves of date-trees; but the country, generally speaking, is quite barren.

SIBBA. See SEBBA.

SIBBALDIA, in *Botany*, so named by Linnæus, in memory of sir Robert Sibbald, knt., M.D., author of *Scotia Illustrata*, a folio volume, published at Edinburgh in 1684, a considerable part of which is dedicated to plants, and in which the first species of the present genus is, for the first time, delineated.—Linn. Gen. 155. Schreb. 208. Willd. Sp. Pl. v. 1. 1567. Mart. Mill. Dict. v. 4. Sin. Fl. Brit. 345. Ait. Hort. Kew. v. 2. 199. Pursh v. 1. 211. Juss. 337. Lamarck Illustr. t. 221. Gærtn. t. 73. —Class and order, *Pentandria Pentagynia*, Nat. Ord. *Seneciaceæ*, Linn. *Rosaceæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, cut half way down into ten segments; its base erect; segments spreading, half-lanceolate, equal in length, permanent, the intermediate ones narrowest. Cor. Petals five, ovate, inserted into the calyx. Stam. Filaments five, capillary, shorter than the corolla, inserted into the calyx; anthers small, obtuse. Pist. Germens five, ovate, very short, in the bottom of the calyx; styles from the middle of one side of each germen, the length of the stamens; stigmas capitate. Peric. none, the closed calyx sheltering the seeds, which are five, somewhat oblong.

Obs. The pistils were found by Linnæus to be sometimes, though very rarely, doubled in number, on the same plant with other flowers that had only five. They appear to vary from five to ten.

Ess. Ch. Calyx in ten segments. Petals five, standing on the calyx. Styles from the side of each germen. Seeds five, in the bottom of the calyx.

1. *S. procumbens*. Procumbent Sibbaldia. Linn. Sp. Pl. 406. Fl. Lapp. ed. 2. 82. Fl. Brit. n. 1. Engl. Bot. t. 897. Lightf. Scot. 175. Fl. Dan. t. 32. (Fragaria sylvestris affinis planta, flore luteo; Sibb. Scot. p. 2.

25. t. 6. f. 1. Scotch Cinquefoil; Petiv. Herb. Brit. t. 41. f. 7.)—Leaflets wedge-shaped, three-toothed.—Native of the summits of the highest mountains of Lapland, Scotland, Switzerland, Siberia, and North America. Tournefort gathered it also in Cappadocia. The plant thrives best in a mouldering micaceous soil, flowering in June and July. The *root* is perennial and woody, throwing out many short, spreading, leafy, herbaceous, round, downy *stems*, which are slightly branched, and procumbent, except sometimes at their flowering extremities. *Leaves* on long stalks, whose base bears a pair of oblong, acute *sipulas*, like those of a rose; their *leaflets* three, on short partial stalks, wedge-shaped, inclining to ovate, green, hairy, entire, except their three large terminal teeth. *Flowers* in small terminal leafy corymbs, inconspicuous, with minute yellow *petals* and *stamens*, inserted into the thickened rim of the green leafy *calyx*. *Seeds* dry, hairy. We have noticed in *Fl. Lapp.* that Plukenet's t. 212. f. 3, cited by Linnæus, and recently copied by Pursh, belongs rather to the *Potentilla subacaulis*; nor does this figure, in essential points, resemble our *Sibbaldia*.

2. *S. erecta*. Tall Sibbaldia. Linn. Sp. Pl. 407. Willd. n. 2. Pursh n. 1. (S. n. 42; Gmel. Sib. v. 3. 186. Pentaphylloides foliis tenuissimè laciniatis, flosculis carneis; Amman. Ruth. 85. t. 15.)—Leaves in numerous linear segments. Stem erect, a span high, round, downy, much branched in a corymbose manner, leafy from top to bottom, many-flowered. *Leaves* crowded, stalked, hairy, repeatedly three-cleft, with linear, obtuse, revolute, entire segments, like those of an *Artemisia*. *Flowers* somewhat racemose, small, flesh-coloured.

3. *S. altaica*. Large-flowered Sibbaldia. Linn. Suppl. 191. Willd. n. 3. "Pall. Act. Petrop. for 1773, 526. t. 18. f. 2." (S. n. 42, var. j; Gmel. Sib. v. 3. 187.)—Leaves in numerous linear segments. Stems slightly branched. Petals roundish-heart-shaped.—Found by Pallas very abundantly on the rocks of Dauria. The *stems* are but about three inches high, slender, often simple, and slightly leafy. *Flowers*, especially their *petals*, three or four times the size of the last, of which nevertheless Gmelin, and at one time Pallas himself, thought this plant a variety.

SIBBENS, or SIVVENS, in *Medicine*, an infectious disease, of a chronic nature, somewhat resembling syphilis, prevalent in the western parts of Scotland. It is said to be so denominated from the appearance of a fungous extuberance from some of the cutaneous fores, not unlike a raspberry; the word *sibben*, or *sivven*, being the Highland appellation for a wild raspberry. Whence it has also been sometimes confounded with the *yaws*, a disease of tropical climates, brought from Africa, and so denominated by the Negroes from the same fruit. See FRAMBOESIA and YAWS.

This malady is not of ancient date in Scotland. The first writer on the subject was Dr. Gilchrist, who, in the year 1765, distributed a short description of the *sibbens* among the people of Ayrshire, which was afterwards published by the Philosophical Society of Edinburgh. (See *Essays and Observations Physical and Literary*, vol. iii. art. 11.) According to tradition in the Highlands, the disease was introduced there by the soldiers of Oliver Cromwell, who laboured under the venereal disease, when garisoned in that country. From thence it is said to have been

carried to Dumfries by a party of soldiers, who had been stationed in the north Highlands; and it is perfectly ascertained, according to Dr. Paterfon, that it was introduced into Ayrshire, about the year 1745, by people who went thither from Dumfries to buy cattle. Since that period, it has constantly prevailed in different places in that district, at different times; sometimes abating so much, both in virulence and frequency of occurrence, as to give hopes that it would entirely disappear; then breaking out again with greater violence, generally in the harvest season, and spreading over several parishes. (See Dr. Paterfon's Letter, in Beddoes's Contributions to Physical and Medical Knowledge, p. 408.) At its first appearance, it occasioned little uneasiness or apprehension to those affected with it; but it was soon discovered to be a formidable disease, resembling in character the venereal disease, and to be propagated extensively by its contagion, inasmuch that, as Dr. Gilchrist expresses it, "great are the perplexity and distress, the suspicion and terror, caused by it, wherever it comes; and hitherto nothing has been able to prevent the spreading of it." The disease differs, however, materially from *lues venerea*, though it is cured by the same remedy; the poison being introduced into the system not through the medium of the organs of generation, but commonly by the mouth and throat, in which the primary ulcerations occur.

The sibbens almost always begins with an inflammation of the throat, first on the *uvula* and *velum pendulum* of the palate, and afterwards on the tonsils, of a dark red colour, which is succeeded in one or two days, and sometimes so late as six or eight, by small pimples, or vesicles, which terminate in ulcers, with a white surface, and red abrupt edges. There is often also an aphthous appearance, or a series of white specks and sloughs, upon the roof of the mouth, and inside of the cheeks and lips, which commonly shews itself also at the corners of the mouth, in a small rising of the skin, of a pearl or whey-colour; upon which part also a small fungous excrescence often appears, not unlike a raspberry, which changes to a scab, and is a pretty sure sign of the disease, although there be no aphthæ or fore throat. The uvula is sometimes destroyed by the ulceration; and children at the breast, when thus affected in the mouth and throat, have perished from hunger, not being able to suck or swallow.

In a little time the constitution is contaminated by the absorption of the poison, and a series of secondary symptoms appears. In some, and especially in adult persons, dark red spots, or sometimes fungous excrescences, arise about the anus and perinæum, which gradually increase and ulcerate. But the most common appearances are eruptions of a pustular character on the skin, containing, however, little fluid, and soon terminating in a dry scab, surrounded by a livid margin, and ultimately in ulceration. In some, and especially in children, these eruptions occupy chiefly the belly, groins, and sides, and are sometimes seen on the face. The ulcers, into which they pass, usually make but small progress, not exceeding in general the point of the finger in size, and being irregular in their forms, and pretty clean, with slightly inflamed edges. In some instances, however, they have been seen to become confluent, and to unite into one large foul ulcer over a great part of the abdomen, exhaling a most intolerable and peculiar stench. In some children, indeed, the whole scalp has gangrened, and the ears have nearly fallen off. Smaller ulcers have also formed on the breast and face, covered with a purulent slough, remaining inert, without pain or inflammation, and seldom increasing in size.

In other cases, where the primary symptoms have been moderate,

moderate, and have subsided, the secondary symptoms, affecting the skin superficially, assume different shapes. The whole surface of the body, Dr. Gilchrist says, has been observed to be mottled, of a dusky copper colour, or a dirty hue, as the discolourings of the skin in this disease commonly are. Infants of the month have had a redness in the lower part of the belly, buttocks, thighs, and part of the legs, where sometimes it terminates abruptly in a ring. In some of these there was an inflammation, and a watery shining swelling of the pudenda. A more certain appearance in such subjects somewhat older are broad red patches, as large as the palm of the hand, over all the trunk, as well as the limbs, attended with inflammation. A cluster, or clusters, of small pustules come out; the skin grows dry, and peels off, leaving a new tender skin beneath; and this will happen a great many times, sometimes in one place, sometimes in another. Scabby eruptions are often met with on the scalp, forehead, inside of the thighs, groins, and parts contiguous; where frequently small hardenings, rising just within the skin, excite a very troublesome itching. Besides the inflammation and excrescences about the fundament already noticed, other appearances of the disease present themselves on the breast, shoulders, and elsewhere, especially a sort of *herpes exedens*, or spreading tetter, healing in one part, while it breaks out in another adjoining, and leaving a great deformity of the skin, after it cicatrizes. In a few cases, an eruption of tubercles occurs upon the face, rather numerous, and in figure and size resembling the small-pox at the height, but being of a reddish colour. These are attended with great heat and tumour of the face, so as sometimes to close up the eyes. In some cases they have spread thickly over the whole body, and suppurated, not unlike the confluent small-pox, and have even proved fatal, as the swelling subsided; but in others, where not so numerous, they gradually decay, without coming to suppuration. In some persons there is a swelling of the surface, without any appearance of tubercles; in which case, the cuticle exfoliates from time to time in fine white reticulated flakes, as often as it is renewed. In other cases, tubercles arise from small bright red spots, of a more intense redness than those just mentioned, which in some places become confluent, and form a flat smooth elevation, which soon becomes of the usual colour of the skin, and sometimes slightly ulcerates. The face, too, is often affected with different kinds of eruption, sometimes alone, and sometimes together with the rest of the body.

Where the disease assumes still greater malignity, larger boils appear dispersed over the arms, shoulders, face, legs, and feet, which suppurate, and form ulcers, which penetrate to the muscular parts, laying them quite bare, and seeming even to corrode them superficially. These ulcerations are of a high florid colour, with scarcely any discharge upon their surface, except a little ichor, which renders them exquisitely tender and painful, and scarcely bearing the mildest applications. Their edges are hard and ragged, their size various, and their appearance very malignant; so that Dr. Gilchrist says, when viewed singly, they might have been mistaken for real cancers; but the number of them, the manner of their coming out, and other circumstances, soon determine the disease to which they belong.

There is one symptom, not yet particularly described, but from which the disease takes its name, which remains to be mentioned. An itchy tetter, or a sort of ring-worm, breaks out in a circular form, which either spontaneously, or from being scratched, becomes raw and excoriated, and does not scab, but continues to ooze out an ichorous hu-

mour. In a short time a fungous excrescence sprouts up, much like a raspberry or strawberry, elevated one half above the surface, and, when fully formed, appearing as if set in a socket cut in the flesh exactly to receive it. Sometimes, however, a black scab forms, crusting over the fore, except at the edges, where there is a crack or ring, like the line of separation between a mortified and a sound part, from which the same sort of ichor is constantly oozing. By degrees this crack enlarges towards the centre, and the scab, being pushed off, gives place to the fungus just described. In other cases, these spongy excrescences are preceded by a dark or grey scurf, resembling the scaly leprosy. These parts are the seat of an intense itching, and when they are excoriated by scratching or rubbing, the fungus has room to sprout up. These sores occupy every part of the body, and many of them are seen in the same subject at the same time; but the excrescences do not always sprout up, and are more commonly produced in the sores which never form a scab, than in the scabby or scaly ones. The fungus is rather indolent than tender to the touch, and its colour is not remarkably different from that of the fungus of other sores.

The sibbens very rarely affects the bones, and then only by extending from the soft parts, and perhaps never attacks the large and more solid bones. In several cases, the teeth, with their sockets, have been lost, and some of the bones of the cheeks and nose have come away, and a portion of the cartilaginous separation of the nostrils has been destroyed by the disease. Several persons die in a state of hectic, from the very extensive ulcerations, before the bones could be materially affected.

Causes of Sibbens.—This disease has been principally prevalent among the lower ranks of the people in Scotland, though not exclusively; for some families of good condition have lost their children by its attacks. The disease affects the young and adult persons equally; but persons advanced in years appear to be less liable to the infection. Children, however, and women, from their more irritable frame, are most susceptible of it.

The disease is commonly communicated by the direct conveyance of the infectious matter by some species of contact, and generally through the medium of the mouth; whence the primary symptoms appear in the mouth and throat, as before described. "It is propagated," Dr. Gilchrist observes, "by using the same spoons and knives, and wiping with the same cloth, which the infected have used, without cleansing or washing them; drinking out of the same glass or cup; smoking with the same pipe; sleeping with the infected, or in the same bed-clothes they have lain in, and handling their sores; by sucking or giving suck; saluting, or kissing, and fondling children, or feeding them in an uncleanly way."

Dr. Gilchrist adds, that it is completely proved, that the sibbens is propagated chiefly by these inattentions to cleanliness, by this circumstance, that "it has never got footing among those of better fashion," nor in towns, where, except with the very lowest, greater attention to cleanliness is generally observed; and that it was unknown among the more cleanly inhabitants of the English border, while it occurred at Dumfries, and along the Scottish boundary. Another proof was deduced from the more frequent occurrence of the disease after autumn, which was thus accounted for. "A company of reapers is made up of very different people, brought together from all parts: they eat and drink promiscuously out of the same cups and dishes; and a few spoons are made to serve a good many, by putting them round from one to another. The same is done with a

pipe

pipe in smoking. When the body is warm, and the pores open, the tender skin of the lips and mouth is most disposed to receive the infection, which the heat, in labouring, will render more active and apt to be communicated. A girl, who had the thrush to a great degree, at this season, spread the disease through a whole parish, where it was not formerly known."

Contagions of this sort are not usually communicable by effluvia; but it seems to be believed, by those who have witnessed the progress of fibbens, that it may be propagated without actual contact. Dr. Gilchrist says, "nor is it unlikely, that, in certain circumstances, the breath may become infectious;" implying, however, his want of positive evidence on the subject. But Dr. Paterfon asserts, that "it is perfectly ascertained, that the breath of people, labouring under the sore throat, is loaded with infection, and communicates the disease, without the contact of ulcers." Beddoes' Contributions, loc. cit.

It will be obvious, from the preceding detail of the symptoms and causes of fibbens, that it is the result of a morbid poison, operating first locally, and afterwards constitutionally, and producing phenomena exceedingly analogous to those of the venereal disease. There is also the farther analogy, as we shall see, that the cure is effected principally, if not exclusively, by mercury: whence several writers, and apparently Dr. Gilchrist among the rest, have deemed it a modification of syphilis. It was soon discovered, says this writer, "to be of the venereal kind, or the foul disease." Dr. Paterfon, however, has pointed out several circumstances which mark a difference between the two. In the first place, he observes, the venereal disease was common in Scotland long before the fibbens appeared; and he had never been able to trace the latter to any person affected with syphilis. Secondly, it is much more infectious than common syphilis, for it seldom gets into a family without infecting every person in it, and frequently spreads rapidly over a village. If the common *lues* were to spread in a similar manner, its progress in all large towns would be truly dreadful. Thirdly, the fibbens is a more purely cutaneous or superficial affection than the common *lues*, for it very rarely indeed occasions buboes, and almost never affects the large bones. And, lastly, the fibbens is much more readily cured than the ordinary form of syphilis; for a much less quantity of mercury removes blotches and extensive ulcers, than is required to cure the secondary symptoms of syphilis, contracted in the ordinary manner. Its ordinary commencement in the organs of deglutition, and its never appearing in a primary form on the genitals, nor being propagated by coition, appear also to establish a distinction between the two maladies.

Cure of Sibbens.—We have partly anticipated this subject in the preceding paragraph, where we have stated that mercury is found to be the specific remedy. It appears that, like syphilis, the disease is perhaps never cured by the unassisted efforts of the constitution; and that mercury, as in the other affection, does not fail to cure it, except in those deplorable cases, where, from the long continuance of the disease, hectic symptoms have come on, and the constitution is so broken down as to be unable to bear the remedy.

It seems to be a well ascertained fact, too, that, of all the preparations of mercury, the corrosive sublimate, or oxymercurate, is the best adapted for the cure of fibbens; that is, it cures it more speedily, and with equal certainty with any other mercurial preparation. This circumstance also constitutes a point of distinction between the two maladies, and may arise, according to Dr. Paterfon's suggestion, from the fibbens being a more superficial or

cutaneous affection than syphilis. Dr. Gilchrist, however, considers it better to adopt the ordinary course of mercury, though not carried to the extent of high salivation, for the purpose of insuring regularity by means of confinement, without which, he says, it often failed, and the symptoms returned, rendering another course of medicine necessary. Experience shews, he says, that the disease is proof against all slight administrations of the remedy; that it will sooner or later return with greater force, or in a worse form; and that it is only to be eradicated by a regular course of medicine, judiciously adapted to the several degrees and circumstances of the malady.

As the extensive propagation of the disease in Scotland was ascribable to the uncleanly practices which prevailed among the lower classes of the people, such as using the same utensils in eating and drinking, passing the same pipe from mouth to mouth, sleeping in the same bed, using the same towel, &c.; so the most effectual check to the progress of the malady was to be expected from a system of prevention, which consisted in adopting a more decent and cleanly proceeding. Dr. Gilchrist recommended the persons employed in harvest-work, each to carry with him a dish, cup, knife, spoon, and a cloth to wipe them with, that all the party might not eat with the same utensils, and transfer contagion to one another. He also strongly urged the impropriety of admitting that common familiarity, which every one claims by custom to kiss and fondle children, and especially to deny it to strangers, and those of low rank. By attending to these, and similar means of prevention, the disease appears to have been materially controlled, and its prevalence diminished.

SIBBIKITTIN, in *Geography*, a town of Africa, in Neola. N. lat. $12^{\circ} 38'$. W. long. $11^{\circ} 35'$.

SIBBO, a town of Sweden, in the province of Nyland; 10 miles S.W. of Borgo.

SIBBOLETH. See **SHIBBOLETH**.

SIBBUL, in *Geography*, a town of Africa, in the country of Barca; 25 miles W. of Augela.

SIBDA, in *Ancient Geography*, a town of Asia Minor, in Caria; one of the six towns which Alexander the Great placed in dependence on that of Halicarnassus.

SIBELLA, in *Geography*, a mountain of Calabria Ultra; 9 miles E.S.E. of St. Severina.

SIBENEN, a river of Switzerland, which runs into the Kander, 4 miles W. of Spietz.

SIBENTAAL, a town of Austria; 8 miles W. of St. Polten.

SIBERIA, or, as it is sometimes denominated, *Asiatic Russia*, is that part of the immense territory of the Russian empire, which lies to the E. of the Ural chain of mountains, by which the empire is intersected from N. to S. and thus divided into two parts, differing from each other both as to dimensions and quality. Siberia is described as a flat tract of land of considerable extent, declining imperceptibly towards the Frozen ocean, and by equally gentle gradations rising towards the south; where at last it forms a great chain of mountains, constituting the boundary of Russia on the side of China. The large portion of the habitable globe, now distinguished by the appellation of Asiatic Russia, extends from about the 37th degree E. longitude to more than 190° or 170° W. long.; and assuming the degree in this high northern latitude at 30 miles, the length may be computed at 4590 geographical miles. The greatest breadth from the cape of Cevero Vostochnoi, called in some maps Taimara, to the Altaian mountains S. of the sea of Baikal, may be estimated at 28° , or 1680 geographical miles. In British miles the length, at a gross computation, may be stated

SIBERIA.

stated at 5350, and the breadth at 1960, which extent exceeds that of Europe. The vast country of Siberia, says Mr. Tooke, contains, by calculation, upwards of $10\frac{1}{2}$ millions of square versts, comprehending within it several kingdoms, taken by roving Kozaks (Cossacks) on their own account, and then surrendered to the czar, who completed the conquest; at present this country consists of several of the most extensive governments. The farthest eastern boundary is that of Asia, and the seas of Kamtschatka and Ochotsk, and the northern is the Arctic ocean. On the W. the frontiers correspond with those between Asia and Europe, and the southern limits may be stated more at large in the following manner: The river Cuban, part of the Caucasian chain, and an ideal line, divide the Russian territory from Turkey and Persia. The boundary then ascends along the north of the Caspian through the steppe or desert of Ilim, and the eastern shore of the river Ob, to its source in the Altaian mountains, where it meets the vast empire of China, and proceeds among that chain to the sources of the Onon, where it includes a considerable region called Daouria, extending about 200 miles in breadth, to the south of the mountains called Yablonnoy; the limit between Russia and Chinese Tartary being partly an ideal line, and partly the river Argoon, which joined with the Onon constitutes the great river Amur. Thence the boundary returns to the mountainous chain, and follows a branch of it to a promontory on the north of the mouth of the Amur.

The population of Asiatic Russia may be regarded as primitive, except a few Russian colonies recently planted; and the Techuks in that part which is opposite to America, supposed to have migrated from that continent, in their persons and customs are different from those of the Asiatic tribes. Next to the Techuks, most remotely north, are the Yukagirs, a branch of the Yakuts, and further west the Samoyedes. South of the Techuks are the Koriaks, and further south the Kamtschadales, who are a distinct people, and speak a different language. The Lamutes are a branch of the Mandshures or Tunguses, who are widely diffused between the Yenisei and Amur, and the southern tribes, ruled by a khan, conquered China in the 17th century. The Ostiaks, and other tribes of Samoyedes, have penetrated considerably to the S. between the Yenisei and the Irtysh, and are followed by various tribes of the Monguls, as the Kalmucks, Burats, &c. and by those of the Tartars or Huns, as the Teluts, Kirguses, and others. The radically distinct languages amount to seven, independently of many dialects and mixtures.

The vast extent of northern Asia was first known by the name of Sibir, or Siberia; but the appellation is gradually passing into disuse. When the Monguls established a kingdom in these northern regions, the first residence of the princes was on the river Tura, on the site of the town now called Tiumen, about 180 miles S.W. of Tobolsk; but they afterwards removed to the eastern shore of the Irtysh, and there founded the city of Isker near Tobolsk. This new residence was also called Sibir, of unknown etymology, and the name of the city passed to the Mongul principality. Although this is doubted by Coxe, Pallas says that the ruins of Sibir are still visible 23 versts from Tobolsk, and that it gave name to the rivulet Sibirka, and the whole of Siberia. When the Russians began the conquest of the country, they were unapprized of its extent; and the name of this western province was gradually diffused over the half of Asia. The principality established by the Monguls under Sheibuni in 1242 in the western part of Siberia, around Tobolsk and the river Tura, from which it has been sometimes called Tura, has been already mentioned. The actual con-

quest of Siberia commenced in the reign of Ivan Vassilievitch II., who ascended the Russian throne in 1534. Induced by the prospect of establishing a traffic for Siberian furs, he determined to undertake the conquest of the country, and in 1558 added to his titles that of lord of Sibir, or Siberia. Yarmak, a Cossack chief, being driven, by the Russian conquests in the south, to take refuge, with 6000 or 7000 of his followers, near the river Kama, afterwards marched down the Ural chain, defeated the Tartar Kutchun, khan of Sibir, and pressed forwards to the Tobol and the Irtysh, and also to the Oby, and in this astonishing expedition, subjugated Tartars, Vogules, and Ostiaks. Finding it impossible to maintain and complete his conquests with his small army, he surrendered them in 1581, by a formal capitulation, to the czar Ivan Vassilievitch, who nobly rewarded his magnanimity and exertions. This conqueror of Siberia, however, did not live to witness the full accomplishment of this enterprise. He died in 1584; and after his death the discovery and conquests which he had made were prosecuted by regiments of Donskoi Cossacks, sent thither for that purpose, as far as the eastern ocean and the mountains of China; and in the middle of the 17th century this whole part of the world had become a Russian province. A person, whose name was Cyprian, was appointed first archbishop of Sibir in 1621, and at Tobolsk, where he resided, he drew up a narrative of the conquest. About the middle of the 17th century the Russians had extended east as far as the river Amur; but Kamtschatka was not finally reduced till the year 1711. Behring and other navigators afterwards proceeded to discover the other extreme parts of Asia. In his first voyage of 1728, Behring coasted the eastern shore of Siberia as high as latitude $67^{\circ} 18'$, but his important discoveries were made during his voyage of 1741. The Aleutian isles were visited in 1745; and in the reign of the empress Catharine II. other important discoveries followed, which were completed by captain Cook. In the south the Mongul kingdom of Kazan was subdued in 1552, and that of Aitrakhan in 1554, and the Russian monarchy extended to the Caspian sea. In 1727, after previous conflicts, the Russian limits were continued westward from the source of the Argoon to the mountain Sabyntaban, near the conflux of two rivers with the Yenisei; the boundary being thus ascertained between the Russians and the Monguls subject to China. The trade with China has been conducted at Zuruchaitu, on the river Argoon, N. lat. 50° . E. long. 337° , and at Kiachta, about 90 miles S. of the sea of Baikal, N. lat. 51° . E. long. 106° . This boundary between two states is the most extensive on the globe, reaching from about the 65th to the 145th degree of longitude; 80° (lat. 50°) yielding, by the allowance of 39 geographical miles to a degree, 3120 miles.

The most curious antiquities in Siberia seem to be the stone tombs which abound on some steppes, particularly near the river Yenisei, representing in rude sculpture human faces, camels, horsemen with lances, and other objects. Here are also found, besides human bones, those of horses and oxen, with fragments of pottery and ornaments of dress. The most singular ancient monument in Siberia is found on the river Abakan, not far from Tomsk, being a large tomb with rude figures.

The religion of the Greek church, which is professed by the Russians, has made no great progress in their Asiatic dominions. Many of the Tartar tribes in the S.W. are Mahometans, and others are votaries of the superstition of Dalai Lama. But the religious sentiments of the Schamanians are the most prevalent; particularly among the Tartars, Finns, Samoyedes, Ostiaks, Mandshurs, Burats, and Tunguses;

SIBERIA.

gufes; and they have been adopted by the Koriaks, Tchucks, and people of the eastern ifles. On the eastern coaft of the fea of Baikal is the rock of the Schamans, an idol of a peculiar fhape: whilft the Schamanians admit one chief infernal deity and his fubalterns, authors of evil, they alfo believe in one fupreme uncreated beneficent being, who commits the management of the univerfe to inferior deities, and they delegate portions of it to fubaltern fpirits. See SCHAMANS.

The archiepifcopal fee of Tobolfsk is the metropolitan of Ruffian Affia in the north, and that of Aftakhan in the fouth. There is another fee, that of Irkutsk and Nerfhinsk, and fome others of more recent origin.

Siberia is divided into two great governments, thofe of Tobolfsk in the weft, and Irkutsk in the eaft. The fmall provinces are Kolivan, Nerfhinsk, Yakutsk, and Ochotfk. In the S.W. is the government of Caucasus, with one or two other divifions, blending Europe and Affia.

The population of Siberia cannot be computed at above $3\frac{1}{4}$ millions. The political importance and relations of this part of the Ruffian empire principally relate to China and Japan. The manners and cuftoms of Affiatic Ruffia vary with the numerous tribes by whom it is peopled. The Tartars are the moft numerous; next to thefe in importance are the Monguls, one tribe of whom, *viz.* the Kalmucks, are found to the W. of the Cafpian, while the others, called Burats, Torgats, &c. are chiefly round the fea of Baikal. Further to the eaft are the Mandfhurs or Tungufes. See thefe denominations refpectively.

The languages of all the original nations of Affiatic Ruffia are radically different; and among the Tungufes, Monguls, and Tartars, there are fome traces of literature, and not a few MSS. in their feveral languages.

The principal city of Affiatic Ruffia is Aftakhan, which fee. Azof (which fee) derives its importance chiefly from its being a fortified poft. The chief towns on the Affiatic fide of the Volga, are Samara and Staupopol. At the mouth of the river Ural, or Jaik, ftands Gurief; but the chief place after Aftakhan is Orenburgh, founded in the year 1740, and the feat of a confiderable trade with the tribes on the E. of the Cafpian. Beyond the Uralian chain the firft city that occurs is Tobolfsk; which fee. Kolyvan is a town of fome confequence on the river Ob, having in its vicinity fome filver mines of confiderable produce, and north to this is Tomsk. Farther to the E. the towns become of lefs confequence. On the river Yenifei is a fmall town of the fame name, and another called Sayansk. On the river Angara ftands Irkutsk, fuppofed to contain 12,000 inhabitants, the chief mart of the commerce between Ruffia and China, and the feat of fupreme jurifdiction over eaftern Siberia. On the wide and frozen Lena ftands Yakutsk; which fee.

The chief commerce of this part of the Ruffian empire confifts in fables and other valuable furs, for which the Chinefe return tea, filk, and nankeen. That with the Kirgufes confifts in exchanging Ruffian woollen cloths, iron, and houfhold articles, for horfes, cattle, fheep, and beautiful fheep-fkins. On the Black fea there is fome commerce with Turkey, the exports being furs, kaviar, iron, linen, &c. and the imports wine, fruit, coffee, filks, rice. In the trade on the Cafpian the exports are the fame, and the return chiefly filk. The principal Ruffian harbours are Aftakhan, Gurief, and Kifliar, near the mouth of the Terek, but the beft haven is Baku, belonging to the Perfians. The Tartars, on the eaft of the Cafpian, bring the products of their country and of Bucharia, as cotton-yarn, furs, ftuffs, hides, and rhubarb; but the chief article is raw filk from Shirvan and Ghilan, on the W. of the Cafpian.

In Affiatic Ruffia the climate extends from the vine at the

bottom of the Caucasus, to the folitary lichen on the rocks of the Arctic ocean: Through the greater part of Siberia, the moft fouthern frontier being about 50° , and the northern afcending to 78° , the general climate may be confidered rather as frigid than temperate; being in three quarters of the country on a level with that of Norway and Lapland, untempered by the gales of the Atlantic. To the S. of the fea of Baikal, the climate corresponds to that of Berlin, and the N. of Germany. The chains of high mountains, which form the fouthern boundary of thefe provinces, contribute alfo to increafe the cold; fo that the fea of Baikal is commonly entirely frozen from December till May. The fineft climate in thefe eaftern parts is that of Daouria, or the province around Nerfhinsk: and the numerous towns on the Amur evince the great fuperiority of what is called Chinefe Tartary, which is comparatively a fertile and temperate region. The change of the feafons is very rapid; the long winter is almoft infantly fucceeded by a warm fpring; and the quicknefs and luxuriance of the vegetation exceed defcription.

The greater part of Siberia, that is, the middle and fouthern latitudes of it, as far as the river Lena, is extremely fertile, and fit for every kind of produce; but the northern and eaftern parts, being encumbered with wood, are deftitute of this advantage, being unfit both for paf- ture and culture. The whole of this part, as far as the 60th degree of N. latitude, and to the Frozen ocean, is full of bogs and moraffes covered with mofs, which would be abfolutely impaffable, if the ice, which never thaws deeper than feven inches, did not remain entire beneath it. In the central parts vegetation is checked by the fevere cold of fo wide a continent. Towards the S. there are vaft forefts of pine, fir, larch, and other trees, among which is a kind of mulberry, which might thrive in many climates that are now deftitute of it. The fublime fcenes around the fea of Baikal are agreeably contrafted with the marks of human induftry, the cultivated field and the garden. Many parts of Siberia are totally incapable of agriculture; but in the fouthern and weftern diftricts the foil is remarkably fertile. North of Kolyvan barley generally yields more than twelve-fold, and oats commonly twenty-fold. Exclusive of winter wheat, moft of the ufual European grains prosper in fouthern Siberia. In fome parts flax grows wild, and hemp is prepared from the nettle. Woad is found in Siberia, and faffron near the Caucasus. The beft rhubarb abounds on the banks of the Ural or Jaik, in the fouthern diftricts watered by the Yenifei, and in the mountains of Daouria. But it is not poffible that agriculture fhould flourifh while the peafantry are flaves, and fold with the foil. Neverthelefs, an intelligent traveller was furprifed at the abundance of buck-wheat, rye, barley, oats, and other grain which he obferved to the S. of Tobolfsk; where the cattle were alfo very numerous, and in the winter fed with hay. The large garden ftrawberry, called hautbois, is found wild in the territory of Irkutsk; and on the Altaian mountains the red currant attains the fize of a common cherry, ripening in large bunches of excellent flavour. Near the Volga and the Ural are excellent melons of various kinds.

Some of the largeft rivers of Affia belong to the Ruffian empire; fuch are the Ob, of 1900 Britifh miles in courfe; the Yenifei, about 1750; and Lena, 1570. To thefe we may add the Irtifch, the Angara, the Selinga, the Yaik, &c. The lakes of this country are numerous. The moft confiderable in the north of Siberia is that of Piaziufko; that of Baikal, defcribed under that article; a large lake between the rivers Ob and the Irtifch, 170 miles long, divided by an ifland into two parts, called the lakes of Tchang and Soumi.

In this quarter there are many smaller lakes, and others to the N. of the Caspian, some of which are salt, particularly that of Bogdo. To these we may add the Altan Nor, or golden lake, and the lake of Altyn, called by the Russians Teletako. The mountains are the Uralian, the Altaian, Bogdo Alim, or the Almighty mountain, Sinnaia-Sepka, Schlangenbergl, which is the richest in minerals, the Sayansk mountains, the mountains of Nerzhinsk or Russian Daouria, the chain of Stanvooi or mountains of Ochotsk, and Caucasus. For the steppes of Russia, see STEPPE.

Siberia has hitherto been found to possess scarcely any genera of plants; and even all the species of any considerable importance, are those trees which are common to it with the north of Europe. Under the head of the zoology of Asiatic Russia, we may enumerate the rein-deer, which performs the offices of the horse, the cow, and the sheep; the dogs of Kamtschatka, which are used for carriage; the horse, which is found wild, a species of ass, the urus or bison, the argali or wild sheep, the ibex or rock-goat, large stags, the musk or civet, and wild boar; wolves, foxes, and bears; the sable, several kinds of hares, the castor or beaver, the walrus, and the common seal. But it would be superfluous to enlarge. Siberia is so rich in zoology and botany, that, as Mr. Pennant observes, even the discovery of America has scarcely imparted a greater number of objects to the naturalist. The mineralogy of Siberia is equally fertile, and displays many singular and interesting objects. The chief gold mines of Siberia are those of Catherinburg or Ekatherinburg, on the E. of the Uralian mountains, about N. lat. 57°: the mines of Nerzhinsk, discovered in 1704, are principally of lead, mixed with silver and gold; and those of Kolyvan, chiefly in the Schlangenbergl, or mountain of serpents, so called by the Germans, began to be wrought in 1748. The gold mines of Beresof are the chief in the empire; those of Kolyvan and Nerzhinsk being denominated silver mines. Besides the copper mines in the Uralian mountains, there are some in those of Altai. But the iron mines of Russia are of the most solid and lasting importance, particularly those which supply the numerous founderies of the Uralian mountains. Rock-salt is chiefly found near the Ilel, not far from Orenburg. Coal is scarcely known; but sulphur, alum, sal ammoniac, vitriol, nitre and natron, are abundant. Siberia possesses a variety of gems, particularly in the mountain Adunstollo, near the river Argoon, in the province of Nerzhinsk or Daouria. Common topazes are found here, and also the jacint. The kind of jade called mother of emerald is a Siberian product; and beryl or aqua marinus is found in Adunstollo, and in greater perfection in the gem mines of Mourfintsky, near Catherinburg, along with the chrysolite. Red garnets abound near the sea of Baikal. The ruby-coloured schorl has been discovered in the Uralian mountains. The green felspar of Siberia is a beautiful stone, and carved by the Russians into a variety of ornaments. The Daourian mountains, between the Onon and the Argoon, afford elegant onyx. The beautiful stones called the hair of Venus and Thetis, being limpid rock crystals containing capillary schorl, red or green, are found near Catherinburg. The alliance stone consists of a greyish porphyry, united, as if glued together, with transparent quartz. Great quantities of malachite have also been found in the Uralian mountains; one piece of which is said to have weighed 107 poods, or 3852 pounds. Siberia affords beautiful red and green jaspers; and lapis lazuli is found near Baikal. The Uralian chain presents fine white marble; and in the numerous primitive ranges there are many varieties of granite and porphyry. The chief mineral waters of Russia are those of Kamtschatka.

The islands belonging to Asiatic Russia may be distributed into the Aleutian, Andrenovian, and Kurilian groups, with the Fox isles, which extend to the promontory of Alaska in North America. See these articles respectively. For further particulars respecting Siberia or Asiatic Russia, see RUSSIA. See also Coxe's Russian Discoveries; Tooke's Russ. Emp.; and Pinkerton's Geog. vol. ii.

SIBERIAN KOZAKS, or *Cossacks*, a branch of the Donkoi Cossacks, who, instigated by a disposition to roaming and pillage, in the 16th century, abandoned their habitations on the Don, in order to plunder the countries lying eastward. In order to restrain their progress, Ivan Vassilievitch II., who sat upon the Russian throne, assembled, in the year 1577, a considerable army, and got together a fleet of ships to chastise these audacious robbers. These hordes, intimidated by these hostile preparations, dispersed and fled into the neighbouring regions. See the preceding article.

SIBERIAN Barley, in *Agriculture*, a hardy sort of grain of the barley kind. See BARLEY.

SIBERIAN Oat, an useful sort of hardy oat brought from that country. See OAT.

It has been found by some as much superior to the common black oat as the Poland sort is to others. It has the advantages of being capable of being sown with safety in December, and of being fit to cut as soon or sooner than early peas; the produce is greater than the usual sorts; and rain, instead of injuring, rather improves the colour, which is of the pied kind. The kernel is plump and large, and the straw is said to make excellent fodder for live-stock of the neat cattle kind.

SIBIDOOLOO, in *Geography*, a town of Africa, in the state of Manding, the government of which is a republic, or rather an oligarchy; 40 miles N.E. of Kamalia.

SIBIL-EL-MULSIH, a town of Arabia, in the province of Hedsjas; 120 miles N.N.W. of Mecca.

SIBILI, a town of Africa, in the kingdom of Bambara; 25 miles N.E. of Sego.

SIBILIAKOVA, a town of Russia, in the government of Tobolsk, on the Irtysh; 28 miles N. of Tara.

SIBIRIXOA, a town of New Mexico, in the province of Cinaloa; 45 miles N.N.W. of Cinaloa.

SIBNIBAS, a town of Hindoostan, in Bengal; 10 miles E.N.E. of Kishenagur. N. lat. 23° 25'. E. long. 88° 50'.

SIBOCKOO, a town on the E. coast of the island of Borneo. N. lat. 4° 24'. E. long. 117° 12'.

SIBOURNE, a town of France, in the department of the Lower Pyrenées, on a small river opposite to St. Jean de Luz.

SIBRAIM, or SABARIM, in *Ancient Geography*, a place which terminated the land of promise towards the north. Ezekiel says (xlvi. 16.) that this city was between the confines of Hamoth and Damascus, probably the same which Abulfeda calls Houverin, a village of the country of Ems, or Hamoth, S.E. of that city.

SIBSIB, in *Zoology*, an animal of the empire of Morocco, abounding in the mountains of the province of Sufe; of an intermediate species between the cat and the squirrel; somewhat similar to the ichneumon in form, but not half its size: it inhabits the Atlas, and lives in holes, among the stones and caverns of the mountains; it has brown hair, and a beautiful tail, resembling that of a squirrel, about the length of its body. The Shelluks and Arabs eat this animal, and consider it a delicacy. This is the only animal which the Mahometans torment before its death, which they do by taking hold of its hind-legs, and rubbing it on a stone, or flat

flat surface, for a few minutes, which operation causes the animal to scream out. They then cut its throat, according to the Mahometan custom. In taste it is said to resemble a rabbit; but friction, as they pretend, is necessary to render it tender and palatable.

SIBTHORP, JOHN, in *Biography*, an eminent botanist and traveller, was the youngest son of Dr. Humphrey Sibthorp, professor of botany at Oxford, where the subject of the present article was born, October 28, 1758. He received the first rudiments of his education at Magdalen school, from whence he was removed to the school at Lincoln. In due time he entered at Lincoln college, Oxford; but upon obtaining the Radcliffe travelling fellowship, he became a member of University college. Being intended for the medical profession, he was necessarily sent to Edinburgh, to complete that branch of his education; but he took the degree of doctor of physic in his own university. The taste he had early imbibed for natural history, especially botany, was cultivated at Edinburgh, and indulged in a tour to the Highlands of Scotland. After his return from thence, he visited France and Switzerland, spending a considerable time at Montpellier, where he formed an intimacy with the amiable Broussonet, (see PAPHYRIUS,) collected many plants of that country, and communicated to the Academie des Sciences of Montpellier, of which he became a member, an account of his numerous botanical discoveries in the neighbourhood. The death of an elder brother of his father, by which a considerable estate devolved on the latter, occasioned Dr. J. Sibthorp to return to England in 1783, when, on his father's resignation, he was appointed to the botanical professorship. For this his Oxford degree of M.D. was necessary. (See SHERARD, and SIBTHORPIA.) It was perhaps the last service he expected from it, for he was a favourite son, and had besides an ample independency of his own in prospect, from the estate of his mother, who was his father's second wife. These expectations, and his academical appointments, though they released him from the calls of his profession, only rivetted more firmly his ardent attachment to botany; his passion for which became, by those appointments, a duty; nor was he ever, to his last hour, disposed to shrink from the task he had undertaken, or to prefer any relaxation, or any indulgence, to this laborious pursuit.

During the stay of professor J. Sibthorp at London, in the winter of 1783, the museum and library of the celebrated Linnæus were sold, by private contract, to the writer of this article. The professor was commendably desirous of adding to great a treasure to the collections, already famous, at Oxford; but the acquisition depended on a resolute and decisive step, which was already taken, and not on any management or negotiation, to which the person entrusted with the sale was superior. This competition occasioned no interruption in the friendship, just then formed, between the parties concerned, which continued increasing during their joint lives.

Dr. Sibthorp passed a portion of the year 1784 at Göttingen, where he projected his first tour to Greece; the botanical investigation of which celebrated country, and especially the determination of the plants mentioned by its classical authors, had, for some time past, become the leading object of his pursuits. He first visited the principal seats of learning in Germany, and surveyed some of its mountains and forests; but it was impossible to quit this part of the world without a considerable stay at Vienna. There he cultivated the friendship of the two professors Jacquin, father and son; studied with peculiar care the celebrated manuscript of Dioscorides, which has so long been preserved in the imperial library; and procured a most excellent draughts-

Vol. XXXII.

man, Mr. Ferdinand Bauer, to be the companion of his expedition. On the 6th of March, 1786, they set out together from Vienna, and passed through Carniola to Trieste, Venice, Bologna, Florence, Rome, and Naples, examining every thing that was curious, and keeping an exact record of their botanical observations. After viewing the celebrated environs of Naples, they sailed from thence early in May, and touching at Messina, as well as at the isle of Milo, they proceeded to Crete. Here, in the month of June, our botanical adventurers were welcomed by Flora in her gayest attire. The snowy covering of the Sphaciot mountains was withdrawing, and a tribe of lovely little blossoms were just peeping through the veil.

Having narrowly escaped shipwreck, in returning to Milo by one of the country vessels, Dr. Sibthorp and Mr. Bauer touched successively at several islands of the Archipelago, visited Athens, and remained for a while at Smyrna. Here they traced the steps of Sherard and Hasselquist, proceeded by land to Bursa, climbed the Bithynian Olympus, and at length reached Constantinople, where they spent the ensuing winter, in the course of which Dr. Sibthorp devoted himself to the study of modern Greek. In a botanical excursion to Belgrad, on the 17th of February, 1787, and another to Bujackderi, March 5, the plants found in flower were almost entirely the same as are met with, at the same season, in England. Dr. Sibthorp's residence at Constantinople, or in the neighbouring isle of Karki, proved favourable to his investigations of the fishes and birds of those regions, by which he was enabled to throw much light on the writings of ancient naturalists.

On the 14th of March, 1787, having joined company with captain Emery and Mr. Hawkins, Dr. Sibthorp and his draughtsman sailed from Constantinople in a Venetian merchant-ship for Cyprus, taking the islands of Mytilene, Scio, Cos, and Rhodes, and touching at the coast of Asia Minor, in their way. A stay of five weeks at Cyprus enabled Dr. Sibthorp to draw up a *Fauna* and *Flora* of that island. The former consists of 18 *Mammalia*, 85 *Birds*, 19 *Amphibia*, and 100 *Fishes*; the latter comprehends 616 species of plants. The particular stations, domestic and medical uses, and reputed qualities of these last, are amply recorded; and the vernacular names of the animals, as well as of the economical plants, are subjoined. The same method is pursued, in a subsequent part of this journal, respecting the plants and animals of Greece, with every thing that could be collected relative to the medicine, agriculture, and domestic economy of that country and the circumjacent isles. The illustration of the writings of Dioscorides, in particular, was Dr. Sibthorp's chief object. The names and reputed virtues of several plants, recorded by that ancient writer, and still traditionally retained by the Athenian shepherds, served occasionally to elucidate, or to confirm, their synonymy. The first sketch of the *Flora Græca* comprises about 850 plants. "This," says the author, "may be considered as containing only the plants observed by me in the environs of Athens, on the snowy heights of the Grecian Alp Parnassus, on the steep precipices of Delphi, the empurpled mountain of Hymettus, the Pentele, the lower hills about the Piræus, the olive grounds about Athens, and the fertile plains of Bœotia. The future botanist, who shall examine this country with more leisure, and at a more favourable season of the year, before the summer sun has scorched up the spring plants, may make a considerable addition to this list. My intention was to have travelled by land through Greece: but the disturbed state of this country, the eve of a Russian war, the rebellion of its bashaws, and the plague at Larissa, rendered my project impracticable." Of the *Mammalia* of

Greece, 37 are enumerated, with their modern names, 25 reptiles and 82 birds. All these catalogues were greatly augmented by subsequent observations, inasmuch that the number of species, collected from an investigation of all Dr. Sibthorp's manuscripts and specimens for the materials of the *Prodromus Flora Græcæ*, amounts to about 3000.

We shall not particularly trace our traveller's steps through Greece, or the various islands of the Archipelago. His health, which suffered from the confinement of a ship, and the heat of the weather, was restored at Athens, where he arrived on the 19th of June, 1787. From thence he prosecuted his journeys in various directions, and with various successes. The ascent of mount Delphis, or Delphi, in Negropont, in a storm of wind and rain, on the 3d of August, was one of his most laborious, if not perilous, adventures; but his botanical harvest was abundant. With regard to scenery, mount Athos, which he visited a week after, seems to have made most impression on his mind. This spot also greatly enriched his collection of rare plants. From hence he proceeded to Thessalonica, Corinth, and Patras, at which last place he embarked with Mr. Bauer, on board an English vessel, for Bristol, on the 24th of September. After a tedious and stormy voyage, they arrived in England the first week in December.

The constitution of Dr. Sibthorp, never very robust, had suffered materially from the hardships and exertions of his journey. But his native air, and the learned leisure of the university, gradually recruited his strength. The duties of his professorship were rather a recreation than a toil. The superintendence of his exquisite draughtsman, now engaged in making finished drawings of the Greek animals, as well as plants; and his occasional visits to the Linnæan and Banksian herbariums, for the removal of his difficulties; all together filled up his leisure hours. He was every where welcomed and admired for his ardour, his talents, and his acquisitions. His merits procured an augmentation of his stipend, with the rank of a Regius professor; both which advantages were, at the same time, conferred on his brother professor at Cambridge. He became a fellow of the Royal Society in 1789, and was among the first members of the Linnæan Society, founded in 1788. In the spring of the year last mentioned, the writer of this, with sir Joseph Banks and Mr. Dryander, passed a week at Oxford, which was devoted to a critical survey of the professor's Grecian acquisitions; nor was the honey of mount Hymettus, or the wine of Cyprus, wanting at this truly attic entertainment. But the greater these acquisitions, the less was their possessor satisfied with them. No one knew, so well as himself, how much was wanting to the perfection of his undertaking, nor could any other person so well remedy these defects. Though he was placed, a few years after his return, in very affluent circumstances; and though his necessary attention to his landed property, and to agricultural pursuits, of which he was passionately fond, might well have turned him, in some measure, aside from his botanical labours; he steadily kept in view the great object of his life, to which he finally sacrificed life itself. No name has a fairer claim to botanical immortality, among the martyrs of the science, than that of Sibthorp.

On the 20th of March, 1794, Dr. Sibthorp set out from London, on his second tour to Greece. He travelled to Constantinople in the train of Mr. Liston, ambassador to the Porte, and was attended by Francis Borone, of whom an account may be seen at the end of the article RUTACEÆ, as a botanical assistant. They reached Constantinople on the 19th of May, not without Dr. Sibthorp's having suffered much from the fatigues of the journey, which had brought on a

bilious fever. He soon recovered his health at Constantinople, where he was joined by his friend Mr. Hawkins from Crete. Towards the end of August they made an excursion into Bithynia, and climbed to the summit of Olympos, from whence they brought a fresh botanical harvest. Dr. Sibthorp discovered at Fanâr an aged Greek botanist, Dr. Dimitri Argyræmi, who had known the Danish traveller Forskall, and who was possessed of some works of Linnæus.

Recovered health, and the accession of his friend's company, caused Dr. Sibthorp to set out with alacrity on his voyage to Greece, on the 9th of September. Passing down the Hellespont, on the 13th, with a light but favourable breeze, they anchored at Koum Cale, in the Troad, spent two days in examining the plains of Troy, and then proceeded to the isles of Imbros and Lemnos. On the 25th they anchored at mount Athos, and passed ten days in examining some of the convents and hermitages, with the romantic scenery, and botanical rarities, of that singular spot, on all which Dr. Sibthorp descants at length, with great delight, in his journal. Their departure was, for some time, prevented, by a few Barbary pirates hovering on the coast, whom these monks, unlike the priests of the Athenian Bacchus, were not potent or valiant enough to defeat, or to turn into dolphins. Our voyagers sailed on the 5th of October, and on the 7th landed at Skiatho. From hence, on the 11th, they proceeded down the strait of Negropont, and on the 13th passed under the bridge of five arches, which connects that island with the main land of Greece. On the 15th, at noon, they entered the harbour of the Pyræus, and proceeded to Athens, where the four succeeding weeks were employed in collecting information relative to the present state of the government, the manufactures, and the domestic economy of that celebrated spot. Here Dr. Sibthorp lost his assistant Borone, who perished by an accidental fall from a window, in his sleep, on or about the 20th of October.

November 16th, Dr. Sibthorp and Mr. Hawkins left Athens by the ancient Eleusinian way, while the classical streams of the Cephissus, the heights of Helicon and Parnassus lay before them. They proceeded to Patras and to Zante, where they arrived in the middle of December, enriched with a large collection of seeds, the only botanical tribute that could, at this season, be collected from those famous mountains. An apothecary at Zante furnished Dr. Sibthorp with an ample and splendid herbarium, of the plants of that island, with their modern Greek names; nor did the winter pass unprofitably or unpleasantly in this sequestered spot; where neither agreeable society, nor copious information relative to our learned travellers' various objects, was wanting. The season was sufficiently favourable in the middle of February, 1795, to allow them to visit the Morea, of which peninsula they made the complete circuit in somewhat more than two months. The Violet and Primrose welcomed them in the plains of Arcadia; and the *Narcissus tazetta*, which Dr. Sibthorp was disposed to think the true poetic Narcissus, decorated in profusion the banks of the Alpheus. The barbarian horde, under whose escort they were obliged to travel, had taste enough to collect nosegays of these flowers. The oaks of the Arcadian mountains presented them with the true ancient Mistletoe, *Loranthus europæus*, which still serves to make birdlime; whilst our Mistletoe, *Viscum album*, in Greece grows only on the Silver Fir. May not this circumstance account for the old preference of such Mistletoe as grows on the oak, among the ancient Britons, and consequently help us to trace the origin of their superstition to Greece? (See DRUIDS.) The Jay, still called by its ancient

ancient name *Κισσα*, which is generally taken for the Magpie, was screaming among these oaks: and the Water Ouzel, *Sturnus Cinclus*, flying along the rocky sides of the alpine rivulets of Arcadia, presented itself to Dr. Sibthorp's recollection, as probably the White Blackbird, which Aristotle says is peculiar to the neighbourhood of mount Cyllene. In vain did our classical travellers look for the beauty of Arcadian shepherdesses, or listen for the pipe of the sylvan swain. Figures emaciated, and features furrowed, with poverty, labour and care, were all that they met with. The vermin of the Pacha's court, with other vermin, who presume to call themselves Christian bishops, and whose places are all bought of the Turks, devour the substance of these poor people, and drive many of them to a precarious and predatory life among the mountains.

Proceeding to Argos, and thence to Mycena, the travellers were highly gratified by finding, on the gate of the latter, those ancient lions, which Pausanias describes as the work of the Cyclops; and near it the reputed tomb of Agamemnon, a circular building, formed of immense masses of stone, placed with such geometrical precision, though without mortar, that not one had given way. That which forms the portal is described by Dr. Sibthorp as the largest stone he ever saw employed in any edifice. A number of fragments of vases, like those commonly called Etruscan, lay among the ruins of Mycena. At Hermione, now called Castri, in the Argolic peninsula, famous for the purple dye anciently prepared there, a vast pile of the shells from which that dye was obtained, and still denominated *Porphyri*, served to ascertain the species, which is *Murex Trunculus* of Linnæus; figured by Fabius Columna in his rare and learned work, *de Purpurâ*, under the name of *Purpura nostras violacea*. (See PURPLE FISH.) From this place Dr. Sibthorp and his friend intended to have coasted along the bay of Argos in a boat, but the sea was then infested with pirates, which obliged them to give up that project, and to return by land to Argos, whence they proceeded to Corinth, Patras, and by way of Elis to Pyrgos. Here they obtained another escort from Said Aga, to whose protection they had before been indebted, and safely reached Calamata, on the gulf of Corone, where they were detained by the celebration of Easter, on the 12th of April, amid a profusion of sky-rockets and crackers. Proceeding in a boat along the barren and craggy shore, covered with bushy and prickly *Euphorbia*, they reached Cardamoula. Here the Greeks are tolerably free from the tyranny of the Turks, and their persons and demeanour exhibit less marks of degeneracy. Panagioté, a popular character, nephew of the Cherife, came down, with a train of followers, to welcome the strangers, and conducted them to his tower-like castle, where a narrow entrance, and dark winding stair-case, led to a chamber, whose thick walls and narrow loop-holes seemed well prepared for defence. The country of Maina, though governed by a Bey, is under the controul of eight subordinate, but partly independent, native chiefs, who, like our old feudal lords, often make war on each other, when they bring not only men but women into the field. No Turk is allowed to live in this district. The land is extremely hilly, and easily defended. Taygetus, the highest mountain in the Morea, and almost rivalling Parnassus, was ascended by our adventurous travellers; but the quantity of snow, and the great distance, prevented their reaching the summit. Panagioté and fifty of his followers accompanied them, and he displayed his botanical knowledge by shewing Dr. Sibthorp daniel, still called *αἰσα*, among the corn, which he said occasioned dizziness; and a wonderful root, the top of which is used as an emetic, the bottom as a purge. This

proved *Euphorbia Apios*, to which the very same properties are attributed by Dioscorides.

From Cardamoula the travellers were escorted by the dependants of this hospitable Grecian chief, along a precipitous road, to Mistra, where they had the unexpected pleasure of meeting a party of their English friends, in the garb of Tartars, with whom they explored the site of ancient Sparta. After returning to Calamata, and surveying from the summit of a neighbouring precipice the ruins of Messenia, with the rich plains watered by the Paniscus, and bounded by the hills of Laconia, Dr. Sibthorp and Mr. Hawkins hastened to Corone, where a Venetian vessel waited to convey them to Zante, which place they reached on the 29th of April. Here Dr. Sibthorp parted from the faithful companion of his tour, whom he was destined never to see again, but in whose friendship he safely confided in his last hours. Mr. Hawkins returned to Greece; while the subject of our memoir, leaving Zante on the 1st of May, experienced a most tedious voyage of twenty-four days to Otranto, though five days are the most usual time for that passage. He touched at the island of Cephalonia, and next at Preverfa, on the Grecian shore, where being detained by a contrary wind, he employed the 7th of May in visiting the ruins of Nicopolis. The weather was unfavourable, and Dr. Sibthorp here caught a severe cold, from which he never recovered. It seems to have proved the exciting cause of that disease, which had long been latent in the mesenteric and pulmonary glands, and which terminated in a consumption. Being obliged by the weather to put in at the little island of Fanno, May 11th, the violent north-west wind "continued," as he too expressively says in his journal, "to nurse his cough and fever." He was confined to his bed, in a miserable hovel, to which, after frequent attempts to sail, he was driven back six times by the unfavourable wind. At length, the vessel was enabled to cast anchor in the port of Otranto on the 24th of May. Here he was obliged to submit to a quarantine of three weeks, part of which, indeed, was allowed to be spent in proceeding to Ancona. From thence he passed through Germany and Holland to England. Of the precise time of his arrival we find no mention. It was in the autumn of 1795, and his few succeeding months were chiefly marked by the progress of an unconquerable disease, for which the climates of Devonshire and Bath were, as usual, resorted to in vain. He died at Bath, February 8th, 1796, in the thirty-eighth year of his age, and lies interred in the abbey church, where his executors have erected a neat monument to his memory.

We have now to record the posthumous benefits which Dr. Sibthorp has rendered to his beloved science, and which are sufficient to rank him amongst its most illustrious patrons. By his will, dated Ashburton, January 12, 1796, he gives a freehold estate in Oxfordshire to the university of Oxford, for the purpose of first publishing his *Flora Græca*, in 10 folio volumes, with 100 coloured plates in each, and a *Prodromus* of the same work, in 8vo. without plates. His executors, the honourable Thomas Wenman, John Hawkins and Thomas Platt, esqrs., were to appoint a sufficiently competent editor of these works, to whom the manuscripts, drawings, and specimens, were to be confided. They fixed upon the writer of the present article, who has now nearly completed the *Prodromus*, and the second volume of the *Flora*. The plan of the former was drawn out by Dr. Sibthorp, but nothing of the latter, except the figures, was prepared, nor any botanical characters or descriptions whatever. The final determination of the species, the distinctions of such as were new, and all critical remarks, have fallen to the lot of the editor, who has also revised the re-

ferences to Dioscorides, and, with Mr. Hawkins's help, corrected the modern Greek names, which last were necessarily taken down but incompletely, from many illiterate and imperfect authorities, on the spot. When these publications are finished, the annual sum of 200*l.* is to be paid to a professor of rural economy, who is, under certain limitations, to be the Sherardian professor of botany, and who is, very properly, obliged to read lectures, that the appointment may not become a reproach, instead of an advantage, to the university. The remainder of the rents of the estate above mentioned is destined to purchase books for the professor; and the whole of the testator's collections, with his drawings, and books of "Natural History, Botany, and Agriculture," are given to the university. This bequest rivals the munificence of Sherard and of Sloane, in the service of natural science, and has only been exceeded by that of the late Mr. Robertson of Stockwell, whose ill-made will was set aside by the common law of the land.

The only work which professor John Sibthorp published in his life-time is a *Flora Oxoniensis*, in one volume 8vo. printed in 1794. It has the merit of being entirely founded on his own personal observation. The species enumerated amount to 1200, all gathered by himself, and disposed according to the Linnæan system, with the alterations of Thunberg, which were then new, but which are now not admitted as improvements. The adoption, though imperfect, of Hedwig's genera of Mosses in this *Flora*, must be esteemed a more fortunate measure. S.

SIBTHORPIA, in *Botany*, was so called by Linnæus, in compliment to Dr. Humphrey Sibthorp, for about forty years professor of botany at Oxford, and the immediate successor of Dillenius. He is said to have delivered but a single lecture in all that time, which was not a successful one, nor do we know of his having enriched the science with any publication. A short letter from this gentleman, announcing the death of his predecessor, is extant among the *Epistolæ ad Hallerum*. In this he modestly expresses a wish that he were equal to the task before him. However imperfect his claims to botanical celebrity, his son has conferred more honour on the above name than either of them could derive from it; see the preceding article.—Linn. Gen. 320. Schreb. 418. Willd. Sp. Pl. v. 3. 340. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 667. Prodr. Fl. Græc. Sibth. v. 1. 439. Ait. Hort. Kew. v. 4. 51. Juss. 99. Lamarck Illustr. t. 535. Gærtn. t. 55.—Class and order, *Didynamia Angiospermia*. Nat. Ord. *Personatæ*, Linn. *Pedicularæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, turbinate, in five deep, ovate, spreading, slightly unequal, permanent segments. Cor. of one petal, bell-shaped, in five deep rounded segments; the three uppermost largest, equal to the calyx; two lower ones shorter, and less coloured. Stam. Filaments four, awl-shaped, not half the length of the corolla, scarce visibly unequal, spreading, two at each side, opposite to its lateral fissures; anthers roundish, two-lobed. Pist. Germen superior, roundish, compressed; style cylindrical, very short, thicker than the filaments; stigma peltate. Peric. Capsule compressed, orbicular, notched, swelling at each side, acute at the margin, of two valves and two cells, the partitions from the centre of each valve. Seeds few, roundish-oblong, convex on one side, flat on the other, inserted into a globose central receptacle.

Eff. Ch. Calyx in five deep segments. Corolla five-cleft, irregular. Stamens spreading laterally in pairs. Capsule compressed, inversely heart-shaped, of two cells, with transverse partitions.

1. *S. europæa*. Sibthorpia, or Cornish Money-wort.

Linn. Sp. Pl. 880. Willd. n. 1. Fl. Brit. n. 1. Engl. Bot. t. 649. (S. prostrata; Salisb. Ic. 11. t. 6. *Alfine spuria* pusilla repens, foliis Saxifragæ aureæ; Raii Syn. 352. Pluk. Phyt. t. 7. f. 6. Cornwall Penny-wort; Petiv. Herb. Brit. t. 6. f. 11.)—Ray observed this curious little plant to be plentiful in Cornwall and Devonshire, on moist banks, and about the margins of rivulets, flowering from June to August, being accompanied by the elegant *Campanula hederacea*. There several succeeding botanists have gathered both. Loeßling found the *Sibthorpia* in Portugal, and Mr. Hawkins on the mountains of Crete; but we know not of its having been noticed in any other country. We have seen it completely naturalized on the lawn of James Vere, esq. in his curious garden at Knightsbridge. The root is fibrous, perennial. Stems prostrate, creeping extensively, branched, slender and delicate, leafy, hairy. Leaves alternate, stalked, horizontal, kidney-shaped, with shallow distant notches, hairy, rather fleshy, about half an inch broad; paler and veiny beneath. Flowers axillary, solitary, on short hairy stalks. Corolla of a pale greenish-yellow, with a purplish tinge in the three upper segments.

The *S. evolvulacea* of Linnæus's *Supplementum* being a very distinct genus, now known by the name of *DICHONDRA*, see that article, the above becomes the only species of *Sibthorpia*.

SIBU, in *Geography*, one of the Philippine islands, about 240 miles in circumference. The principal productions are a species of grain called borona, which serves instead of rice; cotton, tobacco, wax, and civet. This island was discovered by Magellan in 1521. N. lat. 10° 41'. E. long. 123° 30'.

SIBU, Zibu, or Sogbu, a town in the above-mentioned island, containing 5000 houses, the see of a bishop, and residence of a governor. In this town, as some say, Magellan, the celebrated circumnavigator, died. N. lat. 10° 35'. E. long. 123° 44'.

SIBUCO, a town on the west coast of Mindanao. N. lat. 7° 3'. E. long. 122° 10'.

SIBULTQUI, a river of Mexico, which runs into the Pacific ocean, N. lat. 13° 35'. W. long. 89° 16'.

SIBUYAN, one of the Philippine islands, about 36 miles in circumference. N. lat. 12° 36'. E. long. 122° 22'.

SIBYLS, SIBYLLÆ, supposed by Lactantius, whose opinion is generally followed, to be formed of the two Greek words, *σιβ*, for *Θεῖς*, *Dei*, and *βουλῆ*, *counsel*, in *Antiquity*, virgin-prophetesses, or maids supposed to be divinely inspired; and who, in the height of their enthusiasm, gave oracles, and foretold things to come.

Authors do not agree about the number of the Sibyls, though their existence is allowed, as sufficiently established by antiquity. Capella reckons but two, *viz.* Erophyle of Troy, called *Sibylla Phrygia*; and Sinuachia of Erythræ, called *Sibylla Erythræa*. Solinus mentions three; *viz.* Cumæa, Delphica, or the Sibyl of Sardis, and Erythræa; and of this opinion is Aufonius, who thus describes them;

"Et tres fatidicæ nomen commune Sibyllæ,
Quarum tergemini fatalia carmine libri."

Ælian makes their number four, *viz.* the Erythræan, the Egyptian, the Sibyl born at Samos, and another of Sardis in Lydia; and Varro increases it to ten, denominating them from the places of their birth; the Persian, called Sabetha by the Persians; Libyan, according to Euripides, the daughter of Jupiter and Latona; Delphic, named Daphne by Diodorus Siculus, who says that she was born at Thebes in Bœotia; Cimmerian; Erythræan, who prophesied to the Greeks, that were going to besiege Troy, the happy success
of

of their enterprise, and who lived, according to Eusebius, not in the time of the Trojan war, as Varro believes, but under the reign of Romulus; Samian, called, according to Suidas, Pitho, or Perfusion, and according to Eusebius, Eriphile; Cumæan, named Amalthæa by some authors, and by others Demophile or Hierophyle, who is said to have offered to Tarquin the Elder a collection of Sibylline verses, in nine books; Hellepontic or Troiad, born at Marpefus, near the town of Gorgis, in Troas, who lived, according to Heraclides, in the time of Cyrus and Solon; Phrygian, who gave her oracles at Ancyra, the place of her residence; and Tiburtine, named Albunæa, and honoured as a divinity in the vicinity of the river Anio. Of these, the most celebrated are, the Erythræan, Delphic, and Cumæan Sibyls.

Some modern authors, without regarding the authority of Varro, or that of the other ancients, are for uniting all the Sibyls in one; so that, according to them, different names were given to one and the same Sibyl from the different places where she uttered her oracles. She first published her predictions in the city of Erythræa, the place of her nativity; then rambled about the world; and closed her life at Cumæ, in Italy. Dr. Hyde (*De Relig. Persar.*), shocked at the contradictions and fabulous adventures with which the Pagans filled the history of the Sibyls, accounts for them in the following manner. He observes in the constellation Virgo a bright star, which the Persians called Sambula, denoting, in their language, spica, or an ear of corn; and remarks, that the Persians, who were fond of judiciary astrology, looked on the sign of the Virgin as having a greater power than all the other celestial bodies, for discovering future events. The Greeks, having learnt the sciences of the eastern nations, soon adopted these trifling opinions, and, agreeably to their genius, embellished them with their fictions. Their poets soon invented a Sibyl virgin, in allusion to the term *Sambula*, carried her into several countries, and made her act the part of a prophetess. So that, according to this eminent writer, whatever has been said both by the ancients and moderns of the Sibyls and their prophecies, is entirely fabulous. This conjecture, though ingenious, is contradicted by the testimony of antiquity, which allows that there were, in different times and countries, such extraordinary persons, who were reputed to have a particular fore-knowledge of futurity, and whose predictions, carefully collected, were consulted upon important occasions. The Persian Sibyl might, indeed, owe her original to the circumstance above-mentioned, but that is no sufficient argument against the existence of other Sibyls. The Romans had the highest possible veneration for the Sibyls; and if they did not always regard them as divinities, they at least reputed them of a middle nature between gods and men; and some of them received divine honours. Lactantius says, with confidence, that the Tiburtine Sibyl was worshipped as a goddess at Tibur. Some of them also had temples. Justin Martyr mentions that of the Sibyl of Cumæ, in Italy, built over the cave where she delivered her oracles. Virgil mentions this temple, or rather he considers as a temple the grotto where the Sibyl delivered her oracles, because in after-times there was one actually built there. "Vocat alta in Templis Sacerdos," *Æn.* l. 6. We may here add, that the inhabitants of Gorgis, in the Lesser Phrygia, had a custom of representing upon their medals the Sibyl who was born in that city, as being their great divinity. As a farther proof of the worship paid to the Sibyls, they had statues erected to them, which were placed in the temples.

The Sibylline oracles were held in great veneration by the more credulous among the ancients; but they were much

suspected by many of the more knowing. The books in which they were written were kept by the Romans with infinite care; and nothing of moment was undertaken without consulting them. Tarquin first committed them to the custody of two patrician priests, instituted for that purpose. (See *DUUMVIRI Sacrorum.*) How, when, or by whom this collection was made, are circumstances which authentic history has not ascertained. It is not likely that the Sibyls prophesied in verse, far less that they themselves kept their predictions, and digested them into order. All that we know concerning them is, that a woman came to Tarquin the Elder, as Varro says, or, according to Pliny, to Tarquin the Proud, offering him a collection of these verses in nine books, or three according to Pliny; and that she demanded for them 300 pieces of gold; that when the prince refused to give that sum, she threw three of them into the fire, and asked the same sum for the remaining six, which being refused, she burned three more, and persisted in asking the same sum for those that were left: at length the king, fearing that she would burn the other three, gave her the sum which she demanded. Although this story has very much the air of a romance, it is attested by many authors; and it is certain that the Romans had in their possession a collection of the Sibylline verses.

These books were carefully kept till the civil wars of Sylla and Marius: when the Capitol being accidentally set on fire, and burnt down to the ground, these books were burnt with it. This happened in the year before Christ 83. But the Capitol being again rebuilt about seven years after this period, the senate determined to restore the Sibylline oracles; and having procured many that were said to be of this kind, laid them up in the Capitol, in order to supply the place and office of those that were lost. However, the books thus obtained had been dispersed in the hands of many, and were, therefore, by being thus vulgarly known, unfit for the use which the Romans proposed to make of them. On this account a law was passed, which required the surrender of them, and prohibited any from retaining copies of them, under pain of death. Augustus, when he assumed the high-priesthood of Rome, revived this law, and destroyed a great multitude of copies which were brought in. Tiberius caused many more to be burnt, and preserved only those which were found most worthy of approbation for that service of the state for which they were originally intended; and to these, as long as Rome remained heathen, they had constant recourse; till at length Honorius the emperor, A. D. 399, issued an order for destroying them; in pursuance of which, Stilico burnt all these prophetic writings, and demolished the temple of Apollo, in which they were repositied. Nevertheless, there is still preserved, in eight books of Greek verse, a collection of oracles, pretended to be the Sibylline. Dr. Cave, who is well satisfied that this collection is a forgery, supposes that a large part of it was composed in the time of Adrian, about the year 130; that others were added in the time of the Antonines; and the whole work completed in the reign of Commodus. Dr. Prideaux says, that this collection must have been made between the year of our Lord 138, and the year 167. It could not be earlier, for mention is made of the next successor of Adrian, *i. e.* Antoninus Pius, who did not succeed him till the year 138; and it could not be later, because Justin Martyr, in his writings, often quotes it, and appeals to it; and he did not outlive the year 167. Fabricius supposes that this collection does not contain all the Sibylline oracles which were used by the ancient fathers; and that the most ancient Christian

Christian writers, who have quoted the Sibylline oracles, had only a part of the collection which is transmitted down to us. Some of the fathers, not apprized of the imposition, have often cited the books of the Sibyls in favour of the Christian religion; and hence Celsus takes occasion to call the Christians Sibyllists. It must be allowed that St. Clement, St. Theophilus, and some other Greek fathers of the second century, had a much greater respect for the Sibyls than they deserved; for Dr. Lardner says, that he is well satisfied that the Sibylline verses quoted by them are the forgery of some Christian. The ancient Sibylline verses did not recommend the worship of the one God, condemning all manner of idolatry, as those do which are cited by Justin, Theophilus, and Clement. It must be owned, however, that Clement calls the Sibyl a prophetess, and seems to quote her verses as Scripture, in the strictest sense of the word, together with the Scriptures of the Old Testament; so that if there be any books improperly advanced by him into the rank of sacred Scripture, they are the Sibylline books; but Dr. Lardner does not think that he esteemed them of equal authority with the books of the Jewish canon. It is a circumstance that deserves to be mentioned, that the Heathen people knew nothing of these Sibylline verses till they were found out, or rather forged, by some Christian, and then incautiously and imprudently recommended by others. Justin Martyr seems to have been the first Christian writer who quoted the collection now existing of Sibylline oracles, or any Sibylline verses whatever, containing the peculiar doctrines of Christianity. The more ancient writers preceding him, who have mentioned the Sibyls, have quoted nothing but what might be found in Sibylline writings among the Heathens. In the collection above-mentioned, which appears, for the chief part of it, to have been a work of the second century, we have many unquestionable evidences that the writer, who calls himself a Christian, was acquainted with the New Testament, and that in several places he recites the same facts in the same or similar language. The pretended prophecies of this collection are undeniably taken from the New Testament. Whatever was the particular view of the author in composing this work, says Dr. Lardner, and however improperly some ancient writers have produced testimonies from it in their defences of the Christian religion, it is now of use to us, as it affords an argument that our gospels were extant, and in much repute, in the author's time. See farther on this subject, Prideaux's Conn. vol. iv. p. 885, &c. Lardner's Credib. of the Gospel Hist. vol. iv. book i. cap. 29, or Works, vol. ii.

SICABA, in *Geography*, a town on the north-west coast of the island of Negroes. N. lat. $11^{\circ} 26'$. E. long. $123^{\circ} 2'$.

SICÆ, in *Ancient Geography*, a town of Thrace, called in the time of Steph. Byz. Justinianæ.—Also, a town of Asia, in Cilicia.—Also, the name of a place in the vicinity of the town of Alexandria.

SICAL, or SISAL, in *Geography*, a town of Mexico, on the north coast of the province of Yucatan; 60 miles N.W. of Merida.

SICAMINUM, in *Ancient Geography*. See CAIPHA.

SICAN, in *Geography*, a town of Persia, in Khorassan; 15 miles S.W. of Zauzan.

SICANDERAB, a town of Hindoostan, in Dooab; 36 miles W.N.W. of Pattiany.

SICANE, in *Ancient Geography*, a town of Spain. Steph. Byz.—Also, a river of Sicily, which ran near Agrigentum.

SICANUS, a town of Spain, according to Thucydides.

SICAPHA, a town of Africa Proper, being one of those which were situated between the two Syrtes. Ptol.

SICARD, CLAUDE, in *Biography*, a Jesuit missionary, was born at Aubergne, near Marseilles, in 1677. He entered into the society of Jesus in the year 1699, and for several years taught the classics and rhetoric in their schools. He was at length sent on a mission to Syria, and thence to Egypt, where he died at Cairo in 1726. He was a man of deep as well as extensive learning, and an exact observer of what was remarkable in the countries he visited. His first publication was "An easy Method of learning Greek," translated into French from the Latin of Peter Gras, with additions. When abroad, he sent home several curious letters, which were published in the "Nouveaux Memoires des Missions de la Compagnie de Jesus dans le Levant;" in which are likewise published his "Plan of a Work on Egypt, ancient and modern," and "A Dissertation on the Passage of the Red Sea, and Journey of the Israelites."

SICARII, in *Ancient History*, assassins of Judea, who went about the country for the accomplishment of their nefarious purposes, with short swords concealed under their clothes. Josephus has described them in the most odious colours. Eleazar, he says, the chief man among them, was a descendant of Judas, who had persuaded not a few of the Jews not to enrol themselves, when Cyrenius the censor was sent into Judea. For then the Sicarii conspired against all who were willing to submit to the Romans. They treated all such as public enemies. But other pretences were professed, in order to cover their cruelty and avarice. These hypocritical villains were hired to murder Jonathan, the high priest, at the instigation of Felix. Accordingly, some of the assassins, coming up to Jerusalem, with an apparent purpose of worshipping God; and having short swords under their coats, mixed themselves with the multitude, and killed Jonathan. This murder passing unpunished, the robbers afterwards attended the feasts without any seeming concern, and carrying, as before, swords under their clothes, and mixing with the multitudes, killed several people, some whom they reckoned their enemies, and some whom they were hired by others to destroy. This they did, not only in other parts of the city, but within the bounds of the temple itself. Joseph. De Bell. Jud. l. vii. c. 8. § 1. 5.

SICASICA, or CICACICA, in *Geography*, a town of South America, and chief place of a jurisdiction of the same name, in the government of Buenos Ayres, 240 miles in extent; 40 miles N.N.W. of Oruro.

SICAYAP POINT, a cape on the north-west coast of Mindanao. N. lat. 8° . E. long. $123^{\circ} 30'$.

SICCA, a town on the north coast of the island of Sumatra. N. lat. $1^{\circ} 32'$. E. long. $110^{\circ} 40'$.

SICCA, *La*, a small island in the Mediterranean, near the coast of Naples. N. lat. $39^{\circ} 58'$. E. long. $13^{\circ} 52'$.

SICCACOLLUM, a city of Hindoostan, in the circle of Condapilly, on the Kistnah; 35 miles S.S.W. of Ellore.

SICCAPILLY, a town of Hindoostan, in Myfore; 25 miles N.N.W. of Chinna Balabaram.

SICCA-VENEREA, KEFF, in *Ancient Geography*, a town of Africa, situated about five leagues S.W. of Laribus Colonia, and 25 leagues W.S.W. of Tunis. It was built upon the declivity of a hill. Valerius Maximus says, that it had a temple of Venus, at which young females prostituted themselves, in order to obtain a portion that might enable them to marry.

SICCHASIA,

SICCHASIA, a word used by some writers to express that uneasiness at the stomach, and loathing of food, which women are often afflicted with in their pregnancy.

SICCHOS, in *Geography*, a town of South America, in the audience of Quito; 20 miles W. of Latacunga.

SICCINNIS, in *Antiquity*, a mixed kind of dance.

SICERA, in the *Jewish Antiquities*. The Hellenist Jews give this name to any inebriating liquor. St. Chrysostom, Theodoret, and Theophilus of Antioch, who were Syrians, and who therefore ought to know the signification and nature of sicera, assure us, that it properly signifies palm-wine.

Pliny acknowledges, that the wine of the palm-tree was very well known through all the East, and that it was made by taking a bushel of the dates of the palm-tree, and throwing them into three gallons of water; then squeezing out the juice, it would intoxicate like wine.

The wine of the palm-tree is white; when it is drank new, it has the taste of the cocoa, and is sweet as honey; when it is kept longer, it grows strong, and intoxicates. After long keeping, it becomes vinegar.

SICCHAR, in *Ancient Geography*. See the next article.

SICHEM, or **SHECHEM**, called also *Neapolis*, *Sichar* or *Sychar*, and *Mabartha*, a town of Judea, in the tribe of Ephraim, which took up the south side of Samaria. This town was situated on the summit of a mountain, and became one of the strongest and most celebrated towns of this tribe. It was at this place that Abraham lodged, on his way to Canaan (Gen. xii. 6.); and it afterwards became the abode of Jacob, who bought a field in its vicinity, which he gave to his son Joseph, who was buried here. (Gen. xlviii. 22.) Near the same city was Jacob's well or fountain, at which Jesus discoursed with the woman of Samaria. (John. iv. 5.) Joshua gave it to the Levites of the tribe of Ephraim, who belonged to the family of Kohath, the first of the Levites; and it was appointed to be one of the six cities of refuge. (Josh. xxi.) It was at Sichem that Joshua assembled the tribes of Israel (Josh. xxiv. 1.), to renew their engagement of fidelity to God. Sichem was destroyed by Abimelech; but it appears to have been afterwards re-established, because it is said (1 Kings, xii. 2.) that Rehoboam came hither, after the death of Solomon his father; and it was fortified and inhabited by Jeroboam. (1 Kings, xii. 25.) After the ruin of Samaria by Shalmaneser, Sichem was the capital of the Samaritans; and Josephus says (Antiq. lib. xi. cap. 8.), that it was so in the time of Alexander the Great. It was distant, according to Eusebius and Jerom, 10 or 12 miles from Shiloh, 40 from Jerusalem, and 52 from Jericho. Jerom says, that Paula visited the church built on Jacob's fountain; and others, who wrote in the eighth century, speak of this building; but it is not mentioned by Phocas, who wrote in the twelfth century. Sichem or Sichar is now Naplouse, or *Nablous*; which see.

SICHEM, or *Sichen*, in *Geography*, a town of France, in the department of the Dyle, on the Demer; 30 miles N.E. of Brussels.

SICHERFREUTH, a town of Germany, in the principality of Bayreuth; 3 miles S.E. of Bayreuth.

SICHILI. See **SICHLI**.

SICHLAN, a river of Russia, which runs into the Ochotskoi sea, N. lat. 59° 28'. E. long 152° 14'.

SICHOU-LO-HOTUN, a town of Corea, in the sea of Japan. N. lat. 42° 20'. E. long. 130° 29'.

SICHROW, a town of Bohemia, in the circle of Bolestaw; 3 miles N.N.W. of Turnau.

SICHTELEN. See **SUCHTELEN**.

SICHU, a town of Mexico, in the province of Mechoacan; 120 miles N.N.E. of Mechoacan.—**Alfo**, a town of Mexico, in the province of Guasteca; 150 miles W.S.W. of Panuco.

SICIGNANO, a town of Naples, in Principato Citra; 10 miles W. of Cangiano.

SICILIAN Measures, Silk, and Vespers. See the substantives.

SICILIANA, in *Botany*, a name given by Dodonæus, and some other authors, to the great androsæmum, called *tufan*, and *park-leaves*.

SICILIANA, a pastoral movement in a slow jig-time of 3. The character of this movement requires a point to the first note of almost every triplet. Nothing is more pleasing than the Sicilian strains of great masters. Handel hardly ever fails rendering them characteristic, touching, and pleasing; such as, "He shall feed his Flock like a Shepherd;" "Let me wander not unseen," &c.

SICILIANE, or **PASTORALE**, a kind of simple rural music, resounding in Christmas time through all quarters of Naples, and executed by Abruzzese or Calabrian shepherds, upon a species of bag-pipes, called in Abruzzo *zampagne*, and *ciaramelli* in Calabria. The tunes vary, according to the provinces: in the south, they have three different airs; the northern shepherds have only two, to which they add any variations which the boldness of their own genius inspires. The boys learn of their fathers to play upon this instrument, as the means of subsistence. The waits, still kept up in the pay of some corporations in England, are counterparts of these shepherds.

SICILICUM, the name of a weight in use among the ancients; which, some say, was equal to three drachms of our weight: others say only to two.

SICILY, in *Ancient and Modern Geography*, an island in the Mediterranean, the largest of all the islands in this sea, being about 170 British miles in length, and 70 in medial breadth. Swinburne reckons its greatest length at 210 miles, and breadth 133; and places it between N. lat. 36° 25' and 38° 25', and E. long. 12° 50' and 16° 5'. Sicily is separated from the continent by the straits of Messina, which, in some parts, are about four miles broad. (See **CHARYBDIS**, **MESSINA**, and **SCYLLA**.) At Messina, and at the mouth of the straits between the promontories of Pelorus in Sicily and the Lode di Volpa, or Foxes' Tail, in Calabria, is nearly a mile. Many of the ancient historians and poets have stated that this island was formerly joined to the continent, and severed from it, at an unknown period, by some extraordinary convulsion; nor is this opinion at all improbable. Accordingly Pomponius Mela observes, "Sicilia, ut ferunt, aliquando agro Brutio adnexa." To the same purpose Virgil (*Æn.* l. iii. v. 414.) says:

"Hæc loca vi quondam, et vasta convulsa ruina
Diffuisse ferunt, cum protinus utraque Tellus
Una foret. Venit medio vi pontus et undis
Hesperium siculo latus abscidit."

Silius Italicus details this event more at large (lib. xiv.):

"Aufoniæ pars magna jacet Trinacria Tellus
Ut semel expugnante noto, et vastantibus undis
Accepit freta cœrules propulsa tridente,
Namque per occultum cœca vi turbinis olim
Impactum Pelagus lacerata viscera terræ
Discidit, et medio perrumpens arva profundo,
Cum populis pariter convulsas transtulit urbes."

Claudian affirms positively,

"Trinacria quondam Italiæ pars fuit."

Pliny,

SICILY.

Pliny, Strabo, Diodorus, and many others, both historians and philosophers, are of the same sentiments, and pretend that the strata on the opposite sides of the straits agree perfectly; and some imagine, that this separation is recorded in the name given to Rhegium, a town of Brutium. With regard to the breadth of the strait that separates Sicily from Italy, Silius says, *ubi supra*:

“Sed spatium, quod dissociat confortia terræ,
Latratus fama est (sic arcta intervenit unda),
Et matutinos voluerunt transmittere cantus.”

And some persons have even affirmed, that not only the crowing of a cock might be heard from one shore to another, but that a strong voice might be heard through this distance. Mariners have asserted that this canal is not two miles broad.

Sicily, on account of its somewhat triangular form, has been called Trinacria, or Trinacia, and Trinquetra. Its ancient name was Sicania, derived from its inhabitants the Sicani; but when the Siculi took possession of the greatest part of the island, it assumed the name of Sicilia. The interior of Sicily is full of mountains. The ancients, proceeding from the west to the east, enumerated the following; *viz.* Eryx, near the sea and Drepanum, celebrated for a temple of Venus; Cratas, towards the north, in which are the sources of the Eleutherus and Himera, and those of Hypsa, which flowed towards the south; the Gemelli colles, more southerly than the chain of Cratas, in which is the source of the Camicus, and of other rivers; the Nebrodes, northwards and east of the preceding; Maro, still more to the east; the Herzi, from south to north, between the sources of the Himera to the west, and those of Simæthus to the east; and also the famous mount *Ætna*; which see. Among the rivers of Sicily noticed by the ancients, we may enumerate, on the eastern coast, the Simæthus, which rises west of *Ætna*, and south of the town called Engyum, runs towards the south-east, receiving in its course the Chryfas, and discharges itself into the sea near to and north of Murgentium; and the Mela, south of the preceding, and running in a straight direction from west to east; and on the southern coast, the Himera, which had its source in mount Arctefinus, in the environs of Enna, and flowed into the sea at Phictia; and the Hypsa, which proceeding from the interior of the island, flowed into the sea near to and east of Selinus.

The principal places in ancient Sicily are enumerated and briefly described under their appropriate names in different parts of the Cyclopædia.

Sicily was celebrated among the ancients for its extraordinary fertility. Its mines of lead, copper, and silver, and its variety of stones and volcanic productions, have been recorded by ancient and modern writers; and it has been observed, that the summits of its highest mountains have furnished a great number of different marine productions.

This island has undergone a variety of revolutions: it has been denominated, in very remote times, the island of the Sun, and the land of the Cyclops, and of the Lestrygons. It was afterwards called Sicania and Sicily, from the names of its possessors. The Phœnicians also had establishments in this island, and carried on with it a considerable commerce, in the advantages of which the Trojans are said to have participated. The Greeks established themselves in Sicily for the first time after the siege of Troy, and kept possession of it for a long period, forming different republics, and transporting hither their manners and arts, and different opinions, and erecting temples of stone of the Doric order; and in process of time they shared the government of it with the

Carthaginians. These new conquerors, who about 510 years B. C. gained possession of it, brought with them their commerce, their arms, and their gods. They occupied the western and northern shores, whilst the Siculi retained the midland country; and the southern and eastern coasts were inhabited by the Greeks. The Mamertins arriving hither from Italy took possession of Messina, and called over the Romans, who, urged by their ambition, wanted only a pretext of taking up arms against the Carthaginians. After a variety of successive contests, they took possession of the island. The Romans occupied themselves for some years in establishing peace, abundance, and even splendour; and they erected during the time of the republic superb edifices of marble; their power and ambition setting no limits to their magnificence. Under their dominion Sicily became more flourishing than it had been in the time of the Greeks, when it was considered as free. The Sicilians, under the government of the Romans, lost their military genius, and those mutual jealousies which served only to accelerate their own destruction. When the Romans made themselves masters of Sicily, they permitted the inhabitants to retain the temples, the deities, and the forms of worship which the Greeks and other nations had established among them, and till the division of the Roman empire, they maintained a certain character of elegance and refinement. But at this period the monuments of antiquity sunk into neglect; the arts were no longer held in estimation; and talents disappeared on the access of ignorance and barbarism. Towards the end of the fourth century, Syracuse was the first town of Sicily that received Christianity, and soon after other towns and the whole country followed its example; and this event was followed by a neglect of their temples and public monuments. The ignorance of the priests, no less notorious than the fervour of their zeal, induced them to make war against the sciences and the arts, that they might thus the more effectually and speedily destroy Paganism, which cultivated them.

The Sicilians, having relinquished all martial ideas during a long series of generations, turned their attention solely to the arts of peace, and the labours of agriculture. Their position in the centre of the empire preserved them from both civil and foreign foes, except in two instances of a servile war. But the rapacity of their governors was a more constant and insupportable evil. In this state of apathy and opulence, Sicily remained till the seventh century of our era, when the Saracens began to disturb its tranquillity. The barbarous nations of the North had previously invaded and ravaged its coasts, but had not long kept possession. The Saracens, however, were more fortunate. In the year 827 they availed themselves of quarrels among the Sicilians to subdue the country; and they chose Palermo for their capital. The standard of Mahomet triumphed about 200 years. In 1038 George Maniars was sent by the Greek emperor with a great army to attack Sicily. He made good his landing, and pushed his conquests with vigour, and, aided by the valour of some Norman troops, with success. Maniars recompensed them with ingratitude; and by his conduct allowed the Mussulmen an interval of tranquillity, and the Normans an opportunity and pretext of invading the imperial dominions in Italy. Robert and Roger of Hauteville afterwards conquered Sicily on their own account. After a struggle of ten years, the Saracens, in 1072, as Swinburne says, surrendered the rich prize; though others say, that they lost the possession of it A.D. 1058. Robert ceded it to his brother Roger, who assumed the title of *great earl* of Sicily. This first sovereign swayed the sceptre with wisdom and glory, and deservedly ranks among the greatest characters

SICILY.

ters in history. He was succeeded by his son Simon, who, after a short reign, made way for a second son called Roger, the first king; who, in 1127, joined to his Sicilian dominions the whole inheritance of Robert Guiscard, and assumed the regal title. Roger, it is said, was named king of Sicily by the pope, A.D. 1130. During his reign, Sicily enjoyed profound peace. The reign of his son William I. who ascended the throne in 1154, was a period of war and confusion. During the reign of Frederick I. a German, the Saracens, who had revolted, were removed to Puglia, 400 years after the conquest of Sicily, by their ancestors. The Norman line continued till their kingdom was subdued by Henry VI. emperor of Germany. After the battle of Benevento, Sicily submitted to Charles of Anjou, a prince of the French line, A.D. 1266, and having endured quietly for a considerable time oppression and wanton cruelty, at length determined to emancipate itself from his tyranny. Accordingly an insurrection took place in 1282, and after the Sicilian vespers, the insurgents offered their crown to Peter I. king of Aragon, who accepted and defended it against all the efforts of his antagonist, and the thunders of the Vatican. On the death of Alphonso the Magnificent, who succeeded his father Ferdinand I. of Castile, Naples was added to his other dominions; and after his decease in 1458, the history of Sicily becomes uninteresting. At the peace of Utrecht, Sicily was ceded to Victor, duke of Savoy, who soon after was compelled by the emperor Charles VI. to relinquish it, and accept Sardinia as an equivalent.

For further particulars relating to the history of Sicily, we refer to NAPLES.

The climate of Sicily is very hot; the thermometer at Palermo varying in June and July from $73\frac{1}{2}^{\circ}$ to $80\frac{1}{2}^{\circ}$, and when the sirocco wind blows, rising suddenly to 112° . March is the only month in which any chilling winds are felt, and even in the beginning of January the shade is refreshing. The appearance of winter is only seen in the snow that falls on the summit of mount *Ætna*. (See that article.) Although the island has, in many parts of it, the aspect of a rock, the soil is singularly fertile, but it is not now cultivated as it was formerly, when it was reckoned the granary of Rome. The crops of wheat are still so abundant, notwithstanding the oppression of the government, as not only to supply the wants of its own inhabitants, but to afford a large surplus for exportation; and if this island enjoyed the blessing of a free government, it might become one of the richest and most flourishing in the world; for even in its present wretched state of cultivation, one good crop, says Brydone, would be sufficient to maintain the island for seven years; but when he visited the island, the exportation of this commodity had been prohibited for several years past, or, at least, to all such as were not able to pay most exorbitantly for that privilege. The sugar-cane was formerly very much cultivated in this island, but the duties imposed were so enormous, that it has been almost totally abandoned. Silk afforded formerly a profitable branch of trade, but this has very much declined. Besides wheat, which has at all times constituted the riches of this island, they cultivate many other branches of commerce, though none that could bear any proportion to this, were it under a free government, and exportation allowed. Their granaries are so contrived, by excluding the air and keeping the grain dry, as to preserve it for many years. Large quantities of barley and pulse grow in Sicily, but very little oats or millet. Canary-bird seed is exported to a large amount, and is almost peculiar to this island. Large quantities of oil are exported from places on the north side of the island. Wine and brandy are exported in great abundance; and the wines are very va-

rious. The fisheries, also, are very productive, and great quantities of tunny, anchovies, and sardines, are salted, and sent from the vicinity of the places where they are caught. The art of manufacturing silk, and of the management of the insects that produce it, was established here by Roger, king of Sicily, and it was communicated from hence to the western countries of Europe.

Silk is considered as the second great source of riches to Sicily, corn being undoubtedly the first: a quantity of silk, equal in value to a million of ducats (187,500*l.*) is annually exported. Palermo and Messina alone send it out; a considerable quantity of the materials is manufactured in both places; but Palermo, which employs nine hundred looms, exports very little, most of its silks being used at home. Messina employs twelve hundred looms, and Catania rather more. In the Messinese manufactures a variety of silks is made, but the silk is seldom well drawn, dyed, or matched, and the work is apt to prove hard and to rub. Most of it goes to the Levant.

A large quantity of barilla is shipped from the southern coast. The whitest and heaviest salt is produced at Trapani. This island also furnishes fumach, hare and rabbit-skins, rags, sulphur, &c. for exportation.

Soda is a commodity of which they have an ample supply, and they every year send great quantities of it to the glass-houses at Venice. They have likewise a considerable trade in liquorice, rice, figs, raisins, and currants, the best of which grow among the extinguished volcanoes of the Lipari islands. Their honey, which is gathered three months in the year, viz. July, August, and October, is very highly flavoured, and in some parts of the island superior to that of Minorca. Although sugar is now no article of Sicilian commerce, enough is made for home consumption; and the sugar-cane is said to thrive very much in several parts of the island. It is said, that towards the north of Sicily they find the shell-fish that yields a kind of flax, of which gloves and stockings are made. Their plantations of oranges, of which 2000 chests are shipped annually from Messina, lemons, bergamots, almonds, &c. afford no inconsiderable branch of commerce. The pistachio-nut is likewise much cultivated; their manna and alum are likewise very profitable. The cantharides fly, which is found on several trees of *Ætna*, is also a Sicilian commodity. These cantharides are said to be preferable to those of Spain. Sicily abounds with mineral springs of both hot and cold water; some of which throw up an oil that is applicable to various purposes. The marbles of Sicily would afford a great source of opulence, if there were any encouragement to work the quarries; and they have also other stones that are serviceable in a variety of ways.

It would, however, be endless to give an account of all the various commodities and curious productions of this island; *Ætna* alone affords a greater number than many of the most extensive kingdoms, and is no less an epitome of the whole earth in its soil and climate, than in the variety of its productions. Besides the corn, the wine, the oil, the silk, the spice, and delicious fruits of its lower region;—the beautiful forests, the flocks, the game, the tar, the cork, the honey, of its second;—the snow and ice of its third; it affords from its caverns a variety of mineral and other productions; cinnabar, mercury, sulphur, alum, nitre, and vitriol; so that this wonderful mountain at the same time produces every necessary, and every luxury of life.

Its first region covers their tables with all the delicacies that the earth produces; its second supplies them with game, cheese, butter, honey; and not only furnishes wood of every

SICILY.

kind for building their ships and houses, but likewise an inexhaustible store of the most excellent fuel; and as the third region, with its ice and snow, keeps them fresh and cool during the heat of summer, so this contributes equally to keep them warm and comfortable during the cold of winter.

The principal trade of this island is carried on at Palermo and Messina; the former consumes of imports four or five times more than the latter; but on account of lighter duties, Messina exports a greater quantity of silk, and supplies the inland towns with more commodities. The business of other places on the coast consists solely in shipping corn, wine, salt, &c. Trapani, on account of its famous salt-pans and the shipping belonging to it, is one of the busiest commercial towns in the island.

According to the enumerations made in 1714, says Swinburne, Sicily contained 1,133,163 inhabitants, including 40,000 ecclesiastics, and 110,000 inhabitants of Palermo. In 1615 it contained 1,107,234; in 1505, 488,500, without reckoning the inhabitants of Palermo or Messina.

When Mr. Brydone visited the island in the year 1770, he says that the inhabitants, by the last enumeration, amounted to 1,123,163, of which number there were about 50,000 that belonged to the different monasteries and religious orders; the inhabitants of Palermo were computed at 150,000. The number of houses in the island were estimated at 268,120; so that allowing the enumeration and the estimate to be just, the number to a house appears to have been between five and six. The vicissitudes and commotions that have more recently occurred have not been favourable to an increase, but must rather have contributed to a diminution of the population.

The provinces in this island are three: *viz.* Val di Noto, 260 miles in circumference; Val di Mazara, 302 miles in circumference; and Val Demona, 313 miles in circumference: they contain 42 towns belonging to the demefne, and 310 baronial.

Sicily is governed by a viceroy, in whose absence the archbishop of Palermo is regent. The general assembly of parliament is composed of 66 archbishops, bishops, abbots and priors, which form the *braccio ecclesiastico*: 58 princes, 27 dukes, 37 marquises, 27 counts, 1 viscount, and 79 barons, form the *militaire*; and the *demaniale* consists of 43 representatives of free towns. Out of each *braccio* four deputies are chosen to conduct public business; but the viceroy, the prince of Butera, and the prætor of Palermo, are always the three first. N.B. There are many titled persons that have no seat in the assembly, *viz.* 62 princes, 55 dukes, 87 marquises, 1 count, and 282 other feudatories.

The ecclesiastical government consists of three archbishoprics and seven bishoprics.

The following tables shew the coins, weights, and measures of Sicily.

TABLES OF SICILIAN COINS.

Gold Coins.	Silver Coins.
1. Piece of 6 ducats, or double ounce.	Scudo, equal to 12 taris.
2. Piece of three do. or onza.	Ducat - - 10
3. Piece of two ditto.	Mezzo scudo - 6
4. Piece of one ducat and a half.	Terzo di scudo - 4
	Piece of three tari 3
	— of two tari, equal to the tari of Naples.
	The tari, equal the carlino of Naples.

Brass Coins.

Grano, equal to six Neapolitan calli, or half a grano. Mezzo-grano, equal to three calli of Naples. Other subdivisions are seldom met with.

The ounce, or onza	} is equal to	3 ducats, or 30 taris.
The scudo		12 taris.
The ducat		10 taris.
The tari		20 grano.
The grana		6 piccioli.

Accounts are kept in onza, tari, and grano. Upon an average, the ducat is worth forty-five pence English money.

WEIGHTS AND MEASURES.

There are two sorts of weights used in Sicily.

1. Grande.

1 Cantaro contains 110 rotoli	} This cantaro is equal to	
1 Rotolo - 33 ounces		215 pounds avoirdupois weight.
1 Pound - 12 ounces		
1 Ounce - 30 trapefi		

2. Common.

1 Cantaro contains 100 rotoli	} This cantaro is equal to	
1 Rotolo - 30 ounces		178 pounds weight avoirdupois.

DRY MEASURE.—Corn.

- 1 Salma generale contains 16 tomoli—equal to 20 Winchester bushels, used in measuring wheat.
- 2 Salma a la grossa contains 20 tomoli—equal to 24 Winchester bushels, used for barley, beans, &c.

LIQUID MEASURE.—Oil.

1 Caffis weighs 18 pounds avoirdupois.

Winc.—1 Salma contains 8 quartari. 1 Quart contains 12 quartucii.

LINEAL MEASURE.

- 12 Oncie make 1 palmo, equal to 10 inches 3 lines.
- 8 Palmi make 1 canna, equal to 6 feet 8 inches.

Besides the obligations which the Romans had to the Etruscans and Greeks for their taste and knowledge in the fine arts, the conquest of Sicily 200 years before the Christian era, contributed greatly to their acquaintance with them. Indeed, there was no state of Greece which produced men of more eminence in all the arts and sciences than Sicily, which was a part of Magna Græcia, and which having been peopled 719 years B.C. by a colony of Greeks from Corinth, their descendants long after cherished and cultivated science of all kinds, in which they greatly distinguished themselves, even under all the tyranny of government with which they were oppressed. Fabricius gives a list of seventy Sicilians who have been celebrated in antiquity for learning and genius, among whom we find the well-known names of Æschylus, Diodorus Siculus, Empedocles, Gorgias, Euclid, Archimedes, Epicharmus, and Theocritus. To the Sicilians is given not only the invention of pastoral poetry, but of the wind instruments with which the shepherds and cowherds used to accompany their rural songs.

After the conquest of Greece, the Romans had the taste to admire and adopt the Grecian arts. And the president Montesquieu remarks, with respect to the military art, that one of the chief causes of the Roman grandeur, was their method

method of abandoning their ancient customs, and adopting those of the people whom they had vanquished, whenever they found them superior to their own.

SICIMA, in *Ancient Geography*, a town of Palestine, in Samaria, according to Josephus.

SICINOS, or **PHOLEGANDROS**, the name of one of the Cyclades islands; situated S.E. of Siphnos, E. of Melos, and W. of Jos, and very near it.

SICION, in *Geography*, a small island in the Indian sea, near the coast of Africa. S. lat. $12^{\circ} 35'$.

SICK HERRINGS. See **HERRING**.

SICK, *Iron*. See **IRON SICK**.

SICKHERY, in *Geography*, a town of Hindoostan, in the circar of Gohud; 5 miles N. of Lahaar.—Also, a town of Hindoostan, in the circar of Gohud; 10 miles S.E. of Kooch.

SICKLE, in *Agriculture*, a toothed hook, with which corn is reaped.

There is considerable variety in the construction of the tools which are employed for this purpose in different places; and which, in some, are denominated *sickles*, but in others *hooks*. Some of them are also used in one part of the country, and some in another, being wholly unknown in others.

The *common sickle* is a sort of semicircular piece of wrought iron faced with steel, which in general is from about twenty to thirty inches in length, and about half an inch in breadth, having a sharp toothed-edge cut in the steeled part, from twenty-six to thirty teeth being formed in every inch in length. The teeth all incline towards the handle of the tool, so that it only cuts when it is drawn towards the person using it, and not when introduced through the standing corn in the act of reaping. The *Furness sickle*, a valuable tool of this kind, made use of in a district of that name in the northern part of Lancashire, has a blade two feet six inches long, edged with fifteen teeth in every inch, and in the span of its curvature, measures two feet from the heel to the point. It is a powerful tool, and capable of doing much work in a given time when in good hands, as seen below.

The *smooth-edged sickle*, or *reap-hook*, has a shape and length which are much the same as those in the common sickle, only a little broader; but the edge is smooth or sharp and without teeth.

The *badging* or *bagging sickle* or *hook* is a tool of the same kind, but which is a great deal larger and heavier, as well as broader at the point. It can, however, be used with great effect and expedition by those who are accustomed to this mode of reaping.

The *sickle-hook* is also another tool of this nature, which is made use of in some districts. It is only toothed from about the middle to the point end, by which the waste of grain in cutting is said to be prevented.

By much the most ancient of these tools is the common sickle, and it is probably, on the whole, the best of them, though it is getting much out of use in many parts of the country, being now even scarcely known or employed in the counties of Devon, Cornwall, and Somerset, and many other places in the more western districts of the kingdom, having long since given place to the hooks, the reason of which seems to be the greater ease of performing the work by them, as is commonly supposed, but by no means proved. The sickle is by far the most frugal and economical tool for accomplishing the work with, as causing the least loss of grain. Trials made with the sickle and the reap-hook, have indeed shewn that the latter tool is more expeditious, but at the same time that the loss of grain is far

greater, being estimated at not less than five-sixths of the whole in scattered corn.

This difference is supposed to be produced by the hook having a sharp smooth edge, which cuts the stems, as it is put into the standing corn, before it is gathered into the left hand of the workman; while the sickle having a fine-toothed edge inclining towards the heel part, as has been already seen, does not cut the straws as it is put into the standing crop. Thus, though the hook will execute the work with greater facility, where the workman must have ease, the best mode will probably be to have recourse to the sickle-hook, by means of which, from the manner of its being edged, it will much prevent the above enormous loss of corn which is caused in other ways of doing the business.

It is necessary for the farmer to be aware of this difference in the use of the different tools of the sickle kind, as the hooks are fast introducing themselves into the eastern and even the northern parts of the kingdom, as well as into Ireland, where they were formerly unknown, and prevail much in many other places.

In the above district of Furness, the reaping is wholly and most excellently performed by means of the sickle. At an easy rate of working, three men, it is said, with this tool, will cut a customary acre of six yards and a half to the pole or perch, of long, light, slender corn, bind and stow the same in the course of a day, or less than fourteen hours; and five men with these tools will perform the same quantity of work in a field of the strongest corn, when laid and much entangled. By hard labour from light to dark, three men with this sort of tool will reap, bind, and stow above a customary acre of any kind of grain. See **HARVESTING** and **REAPING of Corn**.

SICKLE-Fish. See **FALX**.

SICKLE-Word, in *Botany*. See **CORONILLA**.

SICKLUPEN, in *Geography*, a town of Prussia, in the province of Samland; 5 miles N. of Tilsit.

SICKNESS. See **DISEASE**.

SICKNESS, *Falling*. See **EPILEPSY**.

SICKNESS, *Green*. See **CHLOROSIS**.

SICKNESS, *Sweating*. See **SWEATING Sickness**.

SICKREE, in *Geography*, a town of Bengal; 26 miles W.N.W. of Ramgur.

SICLOS, a town of Hungary, having a castle on a mountain, in which the emperor Sigismund was imprisoned; 64 miles S.E. of Canischa.

SICLYGULLY, a town of Bengal; 15 miles N. of Rajamal.

SICON, a town of the island of Cuba; 125 miles W.S.W. of Havana.

SICUB, or **SICUP**, in *Natural History*, a name given by the inhabitants of the Philippine islands to a species of hawk, of the bigness of their common hawk, or banoy, which is somewhat larger than our sparrow-hawk. This bird is very elegantly variegated all over its body with yellow, white, and black. See **LAVIN**.

SICULL, in *Ancient Geography*, a people originally of Dalmatia, who established themselves in Italy about the 16th century B. C. They formed a numerous nation, and had possession of a considerable extent of country; as they peopled Umbria, Sabina, Latium, and all the cantons, the occupiers of which were afterwards known under the name of Opici. The Siculi passed into Sicily, and gave it their name. This event is said to have taken place, according to Hellanicus of Lesbos, 80 years before the siege of Troy, or 1364 years B. C. according to the chronology of Thucydides. The name of Siculi, which comprehended all the people who diffused themselves from the Tiber to the eastern extremity

extremity of Italy, the country occupied by the Liburni excepted, was gradually abolished by the separate leagues and distinctions of the Sabines, Latins, Samnites, Oenotrians, and Italians. Herodotus, Thucydides, Plato, and Aristotle, mention these people.

SICULIANA, in *Geography*, a town on the S. coast of Sicily, containing 5000 persons, and belonging to the prince of La Catholica, to whom it yields an annual income of 14,000 crowns. It is remarkable for not having a single convent within its precincts, owing either to the danger of a visit from the Mahometans, or to the recent foundation of the town. The ignorance of the inhabitants, at least with regard to philosophy, is remarkably evinced by an anecdote mentioned by Swinburne. On the wall of his apartment he found notice of a thesis to be maintained in the schools of Girgenti by a native of Siculiana: in which he undertakes to prove, "that the Copernican system is impious, absurd, and contradictory to Holy Writ, from which it is evident, that the earth stands still, and the sun moves round it, like the sails of a windmill round the pivot." Siculiana is pleasantly situated on two hills joined together by a long street; the vale below being full of orange and other fruit-trees, and the view of the sea very extensive; 12 miles N.W. of Girgenti.

SICULONES, in *Ancient Geography*, a people who inhabited the Cimbric peninsula, according to Ptolemy.

SICULOTÆ, a people of Dalmatia, who, according to Ptolemy, were divided into 24 decuriæ.

SICUM, a town of Illyria, on the coast of Dalmatia, between Scardona and Salone, according to Ptolemy and Pliny. The latter says, that the emperor Claudius sent hither his veteran soldiers.

SICUS, in *Ichthyology*, a name used by some authors to express that species of coregonus, called by the generality of authors *Albula nobilis*. This, in the Linnæan system, is a species of *Salmo*.

SICUT ALIAS, in *Law*, a writ sent out in the second place, where the first was not executed.

It is thus called from its beginning, which is in this form: "Georgius, D. G. &c. Vicecomiti Heref. salutem. Præcipimus salutem tibi (sicut alias) præcipem," &c.

SICYANA. See *Gourd WORM*.

SICYEDON, from σικυος, a cucumber, in *Surgery*, a transverse fracture.

SICYON, in *Ancient Geography*, a town of Greece, and capital of a small state in the gulf of Corinth, and not far distant from it. It was anciently called Ægialæ, from Ægialeus, its supposed founder and first monarch. It is not certain whether the whole kingdom, or only its metropolis, was called by that name, but it was exchanged for Apia, from Apis its fourth king; and in process of time it acquired that of Sicyon, who was the 19th monarch. He reigned about 740 years after its supposed foundation; and from that time not only the kingdom, but the whole peninsula of Peloponnesus, was called Sicyonia until its dissolution.

This little kingdom lay on the N. part of the Peloponnesus, since called the bay of Corinth. On the west it had the province of Achaia, and on the east the isthmus, which joins the peninsula to the continent of Greece. Its extent has not been ascertained. Its capital is supposed to have been situated upon the river Asopus, having the bay of Corinth on the north, and the rest of the Peloponnesus at the three other points. Strabo and Livy say, that it was parted from the kingdom of Corinth by the river Nemæa; and Ptolemy adds that it was first called Micone, and afterwards Ægiali; he gave it two cities, Platius and Sicyon, both of which he placed at some distance from the sea.

The territory of this small state was rich, abounding with corn, vines, olive-trees, and other commodities, besides some iron mines. Its metropolis was, in process of time, very much adorned by Sicyon and his successors, with temples, altars, monuments, and statues of all their gods and ancient monarchs. This would be justly deemed the most ancient monarchy in the world, not excepting those of Egypt and Assyria, if it were true that its founder lived about 150 years after the flood, or about 200 years before Noah's death; as some have computed it from Eusebius, who affirms this monarchy to have been founded 1313 years before the first Olympiad, or 2089 B. C. But other chronologers have corrected this mistake, and made him contemporary with Terah, Abraham's father, and stated the commencement of his reign about the year of the world 1915, or even later, about A. M. 1236; by which computation it is brought somewhat lower than the year of the flood 900. This kingdom is said to have had, during an interval of 962 years, a succession of 26 kings, but their reigns are distinguished by no memorable action or conquest. The first king was Ægialeus, and the last Zeuxippus or Deuxippus; but in Blair's chronology the last king is Charidemus, with whom they end, 1089 years B. C. or 15 years after the return of the Heraclidæ into Peloponnesus. In the list of kings, the most remarkable is Sicyon, who gave name to the state, and who is supposed to have built, or at least enlarged, the metropolis of the kingdom, and to have called it by his own name. Accordingly it was not only one of the noblest cities in Greece, on account both of its magnificent edifices and ingenious workmen, but it was a considerable place when the Venetians were masters of the Morea, under the new name of "Basilica," though it has been for near the two last centuries reduced to a heap of ruins, containing only three Turkish, and about as many Christian families. The town was situated on the top of a hill, about three miles from the gulf of Lepanto; and has still several monuments of its ancient as well as modern grandeur, particularly the walls of its famous citadel, of some fine churches and mosques, and a large ancient edifice, called the royal palace, with aqueducts to supply it with water, all which, with other old remains, are described by sir George Wheeler, Voy.

After the death of Zeuxippus, the last king of Sicyon, this state is said to have been governed by the priests of Apollo Carneus, five of whom held the sovereignty only during one year each; after which the Amphictyons swayed the sceptre nine years successively, and Charidemus, the last of them, continued in it 18 years. After this hierarchy had lasted 32 years, the Heraclidæ, who were at that time returned from Peloponnesus, became masters of it, or according to Pausanias, the kingdom was incorporated with the Doreæ, and became subject to that of Argos, the next kingdom to that of Sicyon in respect of antiquity. Anc. Un. Hist. vol. v.

SICYONE, a word used by Hippocrates to express colocynth, and by others for a species of hard-shelled gourd, in the shape of a pear, and by some for a cupping-glass.

SICYONEUM QLEUM, a word used by the ancients to express a medicinal oil, of which there were among them three kinds in use. The first was called *sicyonium simplex*. This was composed of two ounces of the root of the wild cucumber, boiled several hours in a pint of oil. The second sort was called the compound *sicyonium*, and was made of the root of the same plant, with many other ingredients. The third was another compound kind, made not with an infusion of the root, but with the juice of the fruit of the wild cucumber.

SICYONII, among the Romans, were shoes of a more delicate

delicate form, and better ornamented than ordinary, and chiefly worn by the ladies and the gallants.

SICYOS, in *Botany*, a name borrowed from the ancient Greeks, whose *σικυος* is supposed to be our common cucumber, or very near it. The genus before us belongs to the same tribe.—Linn. Gen. 509. Schreb. 664. Willd. Sp. Pl. v. 4. 625. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 349. Pursh v. 2. 444. Juss. 394. Lamarck Illustr. t. 796. Gært. t. 88. (Sicyoides; Tourn. t. 28.)—Class and order, *Monoecia Polyadelphia*. (Linnæus and his followers refer it to *Monoecia Syngenesia*, and Willdenow to *M. Monadelphica*; see *MOMORDICA*.) Nat. Ord. *Cucurbitaceæ*, Linn. Juss.

Gen. Ch. Male, *Cal.* Perianth of one leaf, bell-shaped, with five small awl-shaped teeth. *Cor.* bell-shaped, in five deep ovate segments, united to the calyx. *Stam.* Filaments three, awl-shaped, short, connected at the base; anthers two on each of two filaments, one on the third, (Juss.)

Female on the same plant. *Cal.* Perianth as in the male, superior, deciduous. *Cor.* as in the male. *Pist.* Germen inferior, ovate; style cylindrical; stigma tumid, three-cleft. *Peric.* Berry ovate, beset with spines, of one cell. *Seed* solitary, nearly ovate.

Eff. Ch. Male, Calyx with five teeth. Corolla in five deep segments. Filaments three.

Female, Calyx superior, with five teeth. Corolla in five deep segments. Style three-cleft. Berry with one seed.

1. *S. angulata*. Angular Single-seeded Cucumber; or Chocho Vine. Linn. Sp. Pl. 1439. Willd. n. 1. Ait. n. 1. Pursh n. 1. (Bryonioides flore et fructu minore; Dill. Elth. 58. t. 51. f. 59. Cucumis bryonioides bifragaria, fructu parvo, florum calyce muricato; Pluk. Phyt. t. 26. f. 4. C. canadensis monospermos, fructu echinato; Herm. Parad. t. 133; ibid. p. 108, Bryonioides canadensis, &c.)—Leaves five-angled, minutely toothed, rough; heart-shaped, with an obtuse sinus, at the base.—On the banks of rivers, from Canada to Carolina, flowering in June and July. *Pursh*. The root is annual. *Stem* branched, hairy, weak, climbing by means of long, spiral, divided tendrils. *Leaves* alternate, on long stalks, pointed, more or less toothed, minutely rough, three or four inches broad. *Flowers* whitish, marked with green lines, axillary; the male ones racemose, on a long stalk; female on a much shorter stalk, and capitate. *Fruit* ovate, pale, spinous, half an inch long, about eight or ten together in a round head. *Seed* large, ovate, smooth.

2. *S. parviflora*. Small-flowered Single-seeded Cucumber. Willd. n. 2.—“Leaves five-angled, minutely toothed, smooth; heart-shaped, with a roundish sinus, at the base.”—Native of Mexico. Communicated to professor Willdenow, by the celebrated baron Humboldt, from whose seeds it was raised at Berlin. Annual, like the last, and much resembling it, but the leaves are not rough, nor is their sinus an obtuse angle, but round. The male flowers are not one-tenth so large as in *S. angulata*; the female ones about a quarter the size of that species. The fruit however is but little smaller. Willdenow.

3. *S. vitifolia*. Vine-leaved Single-seeded Cucumber. Willd. n. 3.—“Leaves five-lobed, toothed, hairy and viscid; heart-shaped, with a roundish sinus, at the base.”—Willdenow saw this species in a living state, but was unacquainted with its native country. He describes it as annual, differing widely from both the preceding in having the leaves divided half way down into five lobes, clothed, like the whole plant, with fine viscid hairs, and smelling like *Salvia socinea*. Male as well as female flowers half the size of the first species.

4. *S. laciniata*. Jagged-leaved Single-seeded Cucumber. Linn. Sp. Pl. 1439. Willd. n. 4. (Sicioides fructu echi-

nato, foliis laciniatis; Plum. Ic. 239. t. 243. f. 1.)—Leaves deeply five-lobed, laciniated.—Native of South America.—By Plumier's figure, this species seems to differ from all the foregoing in its deeply divided and jagged leaves, which are very rough on the upper side. The fruit appears more rounded and obtuse than in *S. angulata*.

S. Garcini, Linn. Mant. 297. Burm. Ind. t. 57. f. 3, is rightly, we believe, referred to *Bryonia* by Willdenow, in his Sp. Pl. v. 4. 623. Burmann mistook the *slipula* for the fruit, a rare instance of the kind!

SID, in *Geography*, a small river of England, which runs into the English Channel, at Sidmouth.

SIDA, in *Botany*, a name borrowed from the Greeks, whose *σιδη* has by some been thought a kind of marsh mal-low, nor can we find any other reason for the present application of this name. Theophrastus describes his *σιδη* more particularly than usual, and evidently indicates a species of *Nymphaea*. Lexicographers call *σιδη* the Pomegranate, and Dioscorides uses the word *σιδη* for the rind of that fruit.—Linn. Gen. 352. Schreb. 463. Willd. Sp. Pl. v. 3. 734. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 4. 197. Pursh v. 2. 452. Cavan. Diss. 6. Juss. 273. Lamarck Illustr. t. 578. Gært. t. 134. (Abutilon; Tourn. t. 25. Anoda; Cavan. Diss. 38. Juss. 273.)—Class and order, *Monadelphia Polyandria*. Nat. Ord. *Columniferae*, Linn. *Malvaceæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, simple, of one leaf, angular, cut about half way down into five segments, permanent. *Cor.* Petals five, dilated upwards, emarginate, attached by their claws to the tube of the stamens. *Stam.* Filaments numerous, united below into a tube, separating at the upper part of the tube into capillary segments; anthers roundish. *Pist.* Germen orbicular; styles five, ten, or more, more or less combined below; stigmas capitate. *Peric.* Capsule roundish, angular, depressed, of as many cells as there are stigmas, more or less combined at the base, each with two pointed valves, bursting at the upper part. *Seeds* one or more in each cell, roundish, generally pointed; convex at the outer side; angular at the inner, by which they are attached to the central column.

Obs. This genus includes the *Malvinda* of Dillenius, which has five cells only, with solitary seeds, as well as his and Tournefort's *Abutilon*, whose cells, as well as seeds for the most part, are more numerous. *Anoda* of Cavanilles is very insufficiently distinguished, by the cells of the capsule being rather more united than usual; but there is no clear or decided difference. For the distinctions of *NAPÆA*, referred to *Sida* by Cavanilles, Schreber, &c. see that article. The fruit of the Linnæan *S. periplocifolia* seems peculiar, having two series of cells, according to Schreber.

Eff. Ch. Calyx simple, angular. Style in numerous divisions. Capsule of several bivalve cells, spreading from a centre.

An extensive genus, including most of the columniferous or malvaceous order, that have no external calyx. Cavanilles and L'Heritier have considerably added to the quantity of species. Their number in the 14th edition of Linn. Syst. Veg. is only 27; from which the last of all, being Schreber's *PALAVIA*, is to be expunged. (See that article.) Willdenow reckons up 99, but from these are to be deducted the two *Napææ* of Linnæus, which undoubtedly constitute a distinct genus, as we have shewn in its proper place. In their stead, however, there are two to add from North America. Most of the species are tropical plants, natives of the East or West Indies. Several are found in Mexico and Peru; eight in North America; a few at the Cape of Good Hope, the Mauritius, &c.; none truly wild

in Europe, though *S. Abutilon* is reported to grow in Siberia and Switzerland, where it may perhaps have been naturalized; as has happened to various tropical annuals in colder climates than what is natural to them. Abyssinia has afforded one new species to our gardens; besides which, 34, exclusive of the *Napææ*, are enumerated in Mr. Aiton's valuable work.

The habit of all is more or less shrubby, though several have annual roots. The leaves are alternate, stalked, simple; either entire, notched, or lobed. Inflorescence mostly axillary. Flowers yellow, reddish, or white. The species are disposed in sections, according to the shape of the foliage. We shall give various examples.

Seçt. 1. *Leaves lanceolate, more or less narrow, oblong, or ovate.* Seventeen species.

S. angustifolia. Narrow-leaved Sida. Murray in Linn. Syst. Veg. ed. 14. 621. Willd. n. 2. Ait. n. 1. L'Herit. Stirp. 89. t. 52. Cavan. Diff. 14 and 48. t. 2. f. 2.—Leaves linear-lanceolate, toothed. Stipulas setaceous, with axillary spines. Flower-stalks simple, mostly solitary. Capsules with beaked valves.—Native of Brasil. Perennial, with a shrubby, branched, downy stem, three feet or more in height. Leaves pale and downy beneath, about two or three inches long, half an inch broad, on short stalks, accompanied at the base by two or three minute spines, as well as erect narrow stipulas. Corolla pale, yellow, oblique.

S. spinosa. Prickly Sida. Linn. Sp. Pl. 960. Willd. n. 6. Ait. n. 2. Pursh n. 1. Cavan. Diff. 11. t. 1. f. 9. (*Alcea carpinifolia*, americana frutescens, flosculis luteis, femine duplici rostro donato; Comm. Hort. v. 1. 3. t. 2.)—Leaves ovato-lanceolate, ferrated; somewhat heart-shaped at the base. Stipulas setaceous, with axillary spines. Flower-stalks simple, mostly solitary. Capsules with beaked valves.—Native of the East and West Indies, Senegal, Arabia Felix, and North America. Mr. Pursh says it is found among rubbish, and by road-sides, from Pennsylvania to Carolina, flowering in July and August. This was one of the earliest species cultivated in England, but rather for curiosity than beauty. The broader leaves principally distinguish it from the former, for their flowers are nearly similar. The root is annual or biennial.

S. hispid. Hispid Sida. Pursh n. 2.—“Rough with bristly hairs. Leaves lanceolate, ferrated. Flower-stalks axillary, the length of the footstalks. Outer calyx thread-shaped.”—Described by the above author, from the herbarium of Mr. Lyon, who is said to have met with this plant in the sandy plains of Georgia in North America. The flowers are yellow. If they have really an external calyx, the plant can be no *Sida*; but perhaps a simple setaceous bractea is all that is meant by the above definition. We have seen no specimen.

S. carpinifolia. Hornbeam-leaved Sida. Linn. Suppl. 307. Willd. n. 8. Ait. n. 3. Jacq. Ic. Rar. t. 135. Cavan. Diff. 274. t. 134. f. 1.—Leaves ovate-oblong, smooth, closely ferrated. Stalks axillary, about four-flowered. Capsule with beaked valves.—Mr. Maillon met with this shrub in the garden of a Franciscan convent, in Madeira, and sent it to Kew garden in 1774, where it is treated as a green-house plant, flowering most part of the summer. The native country has not been ascertained. The branches are hairy, spreading, like the leaves, in two directions. The latter are two or three inches long, and nearly half as broad, smooth, with crowded, acute, somewhat unequal, or doubled, ferratures, each tipped with a bristle, as in the genus *Carpinus*. Calyx smooth. Petals yellow, oblique, and partly notched. Capsule of eight cells, each having two spinous beaks. *S. planicaulis*, Cavan.

Diff. 24. t. 3. f. 11, is acknowledged by that writer himself to be the same plant in a young or imperfect condition.

S. maculata. Spotted-flowered Sida. Cavan. Diff. 20. t. 3. f. 7. Willd. n. 12.—Leaves ovate, obtuse, ferrated, downy. Flowers axillary, solitary; racemose at the ends of the branches. Capsule with beaked valves.—Native of Hispaniola. The stem is woody and downy. Lower leaves orbicular; upper ovate, abrupt, with a terminal point. Stipulas awl-shaped, erect, downy. Flower-stalks with a joint. Calyx villous. Corolla large, yellow, with a reddish spot on the base of each petal. Capsule of nine cells.

S. suberosa. Corky Sida. L'Herit. Stirp. 113. t. 54. Willd. n. 13. Ait. n. 4.—Leaves ovate, strongly ferrated, hairy. Stalks axillary, single-flowered, twice the length of the footstalks. Capsule with beaked valves. Stem corky at the base.—Native of Hispaniola. Introduced to the stoves at Kew in 1798, by sir Justly Green, bart., but it has not yet flowered. The stem is one or two feet high, branched, the bark of the lower part corky, and full of fissures; branches hairy. Leaves more oval than in *S. carpinifolia*, pale and hairy. Flowers an inch broad, orange-coloured, with a purple central ring, their stalks and calyx hairy. Capsule small, of nine, slightly connected, cells. The corky bark, which L'Heritier compares to that of *Passiflora suberosa*, is supposed peculiar to the present species.

Seçt. 2. *Leaves wedge-shaped at the base.*

S. rhombifolia. Rhomb-leaved Sida. Linn. Sp. Pl. 961. Willd. n. 18. Ait. n. 5. Pursh n. 3. Cavan. Diff. 23 and 48. t. 3. f. 12. (*Malvinda unicornis*, folio rhomboide, perennis; Dill. Elth. 216. t. 172. f. 212.)—Leaves oblong-lanceolate, acute, ferrated; wedge-shaped and entire at the base. Flower-stalks shorter than the leaves. Stipulas setaceous, with axillary spines.—Native of both Indies and of North America. Cultivated in curious stoves, where it blossoms in summer; but the small yellow flowers have less beauty to boast than most of the preceding, with which the plant agrees in habit, except the tapering entire base of its leaves, whose under side is a little glaucous.

S. ciliaris. Ciliated Sida. Linn. Sp. Pl. 961. Willd. n. 22. Ait. n. 7. Cavan. Diff. 21. t. 3. f. 9, and 275. t. 127. f. 2. (*Malva minor lupina*, betonica folio, flore coccineo, seminibus asperis; Sloane Jam. v. 1. 217. t. 137. f. 2.)—Leaves oval, abrupt, ferrated; entire and somewhat wedge-shaped at the base. Stipulas linear, fringed, longer than the solitary, nearly sessile, flowers. Capsules prickly, not beaked.—Native of dry grassy places in Jamaica, and other parts of the West Indies, flowering after rains. A small, procumbent, rather shrubby species, whose leaves are scarcely an inch in length, and whose long fringed stipulas are very remarkable. The flowers are crimson. Seeds, as well as capsules, rough with minute hairs.

Seçt. 3. *Leaves heart-shaped, entire, or nearly so.*

S. periplocifolia. Great Bind-weed-leaved Sida. Linn. Sp. Pl. 962. Willd. n. 23. Ait. n. 8. Cavan. Diff. 26. t. 5. f. 2. (*Abutilon periplocæ acutioris folio, fructu stellato*; Dill. Elth. 4. t. 3.)—Leaves heart-shaped, entire; elongated at the point; downy beneath. Flower-stalks axillary and terminal, somewhat panicled, much longer than the footstalks. Capsule with five awned cells.—Native of both Indies; long known in our gardens, where it proves annual or biennial only, even in the stove, flowering in summer. Dillenius suspects it to be perennial and shrubby in its native country. The stem with us is three or four feet high. The entire pale or hoary leaves bear some resemblance to those of *Cynanchum acutum*, though

though more elongated. This last plant being reckoned a *Periplocia* by Tournefort and Dillenius, caused the above specific name. The *flowers* are yellowish, small, and fugacious, opening in bright sunshine only.

S. nudiflora. Naked-flowered Sida. L'Herit. Stirp. 123. t. 59, double. Willd. n. 26. Ait. n. 10. (*S. periplocifolia* β ; Linn. Sp. Pl. 963. *S. stellata*; Cavan. Diss. 27 and 349 t. 5. f. 4. *Abutilon amplifolium* folio, caule villosa; Plum. Ic. 2. t. 3.)—Leaves roundish-heart-shaped, pointed, obscurely crenate; downy beneath. Panicle terminal, racemose, leafless. Capsules without awns.—Native of Peru and the West Indies. Cultivated by Miller in 1731. Linnæus confounded this with the last, from which it differs in being a more handsome plant, with larger more copious *flowers*, rounder *leaves*, whose edges are scarcely ever entire, but minutely crenate; and *capsules* of five, six, or seven cells, pointed, but destitute of awns.

Seet. 4. *Leaves heart-shaped, indented. Stalks single-flowered.*

S. triquetra. Triangular-stalked Sida. Linn. Sp. Pl. 962. Willd. n. 27. Ait. n. 11. Jacq. Hort. Vind. v. 2. 54. t. 118. Cavan. Diss. 26. t. 5. f. 1.—Leaves heart-shaped, pointed, finely serrated. Flower-stalks somewhat racemose. Capsule abrupt, without awns. Branches triangular.—Native of the West Indies. Sent to Kew by professor Jacquin, its original discoverer, in 1775. This is considerably allied to the last in habit, though differing essentially in the characters here indicated. The primary *flower-stalks* are indeed solitary and axillary, but the greater part are racemose and leafless. *Flowers* small, yellow, with a purple eye. *Capsules* of five close, elongated, parallel lobes, abrupt at the summit, each lobe, or cell, pointed, but not awned.

S. patens. Spreading Sida. Andr. Repof. t. 571. Ait. n. 13.—Leaves heart-shaped, pointed, deeply serrated. Flower-stalks hairy, solitary, much longer than the footstalks. Capsule of five separate, taper-pointed cells.—The seeds of this fine new species were brought by Mr. Salt from Abyssinia, and plants were raised from them by lord viscount Valentia, in 1806. It flowers in the stove from July to September, and is biennial. The *branches* are round, and slightly hairy, like all the *stalks*, and the large, slender-pointed *leaves*, whose margins are deeply and acutely serrated. *Flowers* near two inches wide, yellow speckled with orange; their *petals* spreading and undulated. Cells of the *capsule* distinct almost to the very base, near an inch long, ovate, tapering gradually to a point, each containing four or five seeds.

S. crispa. Bladder Sida. Linn. Sp. Pl. 964. Willd. n. 40. Ait. n. 16. Pursh n. 4. Cavan. Diss. 30. t. 7. f. 1. and 275. t. 135. f. 2. (*Abutilon americanum*, fructu subrotundo pendulo, e capsulis veficariis crispis conflato; Mart. Cent. 29. t. 29. *A. veficarum crispum*, floribus melinis parvis; Dill. Elth. 6. t. 5. *A. aliud veficarium*, flore luteo, minus; Plum. Ic. 15. t. 25*.)—Leaves heart-shaped, pointed, crenate, downy. Flower-stalks solitary; deflexed when in fruit. Capsule of numerous, inflated, membranous, undulated cells.—Native of the Bahama islands, and the sea-coast of Carolina, flowering from July to September. An annual species, often seen in curious gardens, and remarkable for the bladderous pendulous fruit, of many tumid cells, with undulating furrows between. The *flowers* are small and white, on long, slender, simple, axillary stalks.

S. sylvatica. Tawny-flowered Sida. Cavan. Diss. 56 and 276. t. 133. f. 2. Willd. n. 42.—Leaves heart-shaped, taper-pointed, crenate, finely downy. Flower-

stalks axillary, aggregate, single-flowered, much longer than the footstalks. Capsules orbicular, of numerous abrupt cells.—Gathered by Dombey, in woods near the river Maragnon, in Peru. This fine species, not noticed in the Hortus Kewensis, flowered in Mr. Cooper's stove at Norwich, in November, 1811. We have also a Peruvian specimen, unnamed, from the late M. L'Heritier. The item is eight or ten feet high, with numerous, round, downy, leafy branches. *Leaves* stalked, roundish-heart-shaped, with a long taper point, finely crenate throughout, five or seven-ribbed, clothed on both sides with soft, velvet-like, dense pubescence; rather paler beneath; the lower ones a span or more in length, and about half as much in breadth; upper much smaller and narrower, with shorter *footstalks*. *Flower-stalks* two, three, or four together, from the bosoms of the upper leaves, and about half their length, equal, erect, single-flowered, downy, jointed near the top, but without *bractæas*. *Calyx* covered with dense starry down. *Corolla* spreading about an inch and a half, of a peculiar pale brownish-orange, or bright cinnamon colour, very elegant, though not gaudy. *Capsule*, according to Cavanilles, globose, concave in the middle, downy, of from thirty to thirty-six close, compressed, abrupt, unawned, single-seeded cells.

S. arborea. Great-flowered Sida. Linn. Suppl. 307. Willd. n. 43. Ait. n. 17. L'Herit. Stirp. 131. t. 63. (*S. peruviana*; Cavan. Diss. 36. t. 7. f. 8, and 276. t. 130.)—Leaves orbicular, heart-shaped, crenate, finely downy, with short points. Flower-stalks axillary, solitary, single-flowered, longer than the footstalks. Capsules orbicular, of numerous abrupt cells.—Native of Peru. A green-house rather than a stove-plant, both at Paris and London, flowering in the latter part of summer. This is much larger in all its parts than the foregoing, to which it is, in many respects, nearly allied. The *leaves* however differ in their short points, greater breadth, and more orbicular form, the lobes at their base folding over each other, so as to give the leaf a peltate aspect. The *footstalks* are six inches long in the lower leaves, two or three in the upper. From the bosoms of the latter proceed the *flower-stalks*, twice the length of their corresponding footstalks, always solitary, as far as we have observed, though Willdenow says they are in pairs. We suspect he confounded this species and the last. The *flowers* are full twice the size of *S. sylvatica*, and of a pale sulphur-colour, or yellowish-white.

S. Abutilon. Broad-leaved Yellow Sida. Linn. Sp. Pl. 963. Willd. n. 47. Ait. n. 21. (*Althæa altera*, five *Abutilon*; Camer. Epit. 668. *A. lutea*; Ger. Em. 935. *Abutilon Avicennæ*; Besl. Hort. Eyft. æstiv. ord. 6. t. 10. f. 1.)—Leaves roundish-heart-shaped, pointed, toothed, downy. Flower-stalks axillary, solitary, shorter than the footstalks. Capsules orbicular, of numerous, abrupt, double-beaked cells.—Native of both Indies; long cultivated in the gardens of Europe, and partly naturalized in the warmer parts, so that Haller admits it as a Swiss plant, under his n. 1075. Gerarde raised it every year, from Spanish or Italian seeds; for he says it hardly ripened any in his garden, not flowering till September. The root is annual. Stem much branched. *Leaves* not unlike the *arborea* in shape, but more pointed, more coarsely notched, often obscurely lobed, and less softly pubescent. *Flowers* yellow, not an inch wide, solitary, except that each is frequently accompanied by a young flowering branch. *Capsules* downy, with a sharp, double, incurved beak to each cell.—This, like many other old garden plants, of which no coloured plates exist, ought to be figured in periodical publications,

lications, instead of the repetitions, so justly complained of, in the generality of those works. Haller records, after Linder, that the seeds of *S. Abutilon*, taken to the amount of an ounce, have been found powerfully soporific.

SECT. 5. *Leaves heart-shaped, indented. Stalks many-flowered or racemose.*

S. umbellata. Umbellate Sida. Linn. Sp. Pl. 962. Willd. n. 76. Ait. n. 31. Jacq. Hort. Vind. v. 1. 22. t. 56. Cavan. Diff. 28. t. 6. f. 3, and 275. t. 129. f. 2. — Leaves roundish-heart-shaped, toothed, somewhat angular, rather downy. Stalks umbellate, axillary and panicled. Capsules with double-awned cells.—Native of the West Indies. Annual or biennial, flowering in our stoves in autumn. The leaves are light green, pliant, minutely hairy, and though soft to the touch, yet not of that velvet-like texture so remarkable in most of the preceding sections. Flowers small, yellow, five or six in each long-stalked axillary solitary umbel. The upper umbels are, many of them, unattended by leaves. The valves of the capsule have each a sharp, slender, erect beak.

S. paniculata. Panicled Sida. Linn. Sp. Pl. 962. Willd. n. 78. Ait. n. 32. Cavan. Diff. 16. t. 12. f. 5. Swartz Obf. 259. (*S. atro-sanguinea*; Jacq. Coll. v. 1. 49. Ic. Rar. t. 136. *S. capillaris*; Cavan. Diff. 10. t. 1. f. 7.)—Leaves ovate or heart-shaped, toothed, downy on both sides. Flowers panicled, with capillary stalks. Capsules rough, with double-beaked cells.—Native of calcareous rocks in Jamaica, as well as Peru and Brazil. Sir Joseph Banks is recorded as having sent it, in 1795, to Kew, where it flowers in the stove from July to September. Mr. Aiton marks this species as biennial. Jacquin describes it as an evergreen shrub, eighteen feet high, almost always in bloom. Our wild Peruvian specimens appear woody, with rough round branches. The leaves are stalked, of a roundish-ovate, partly heart-shaped figure, various in length from one to three inches, strongly ferrated, clothed on both sides, but most densely beneath, with stellated pubescence. Flowers small, crimson, copious, on long, very slender, panicled stalks. Corolla more or less reflexed.

S. terminalis. Terminal-stalked Sida. Cavan. Diff. 29. t. 6. f. 6. t. 195. f. 2. Willd. n. 82. — Leaves heart-shaped, doubly crenate, somewhat lobed, very soft and downy. Clusters simple, somewhat corymbose, on very long, solitary, terminal stalks. Capsule hairy.—Gathered at Monte Video, by Commerçon, whose specimen is before us. The stem is shrubby, much branched, downy, apparently of rather humble growth. Leaves dependent, shorter than their footstalks, heart-shaped, bluntnish, veiny, scarcely an inch long, extremely soft, their notches broad, round, and very unequal. Flower-stalks terminal, though the branches are often subsequently elongated beyond them, solitary, simple, naked, four or five inches in length, round, downy, each bearing four or five rather large, stalked, corymbose, yellow flowers, externally purplish, with linear bractæas, which soon fall off. The capsule, twice as long as the calyx, is thickly clothed with long upright hairs.—The curious reader may observe how Willdenow, without any other guide than the description and plates of Cavanilles, has altered his specific character for the worse. Willdenow terms the leaves "ovato-lanceolate" and "toothed," for neither of which there is any foundation; but it may serve us, in any other doubtful case, to understand his phraseology, for which reason, chiefly, we here point it out.

SECT. 6. *Leaves heart-shaped, three-pointed, or angular at the base.*

S. crassifolia. Thick-leaved Sida. L'Herit. Stirp. 125. t. 60. Willd. n. 84. (*S. tricuspidata*; Cavan. Diff. 30.

t. 6. f. 5.)—Leaves heart-shaped, toothed, pointed, obscurely lobed, downy on both sides. Stalks solitary, single-flowered, about equal to the footstalks. Capsules with double-beaked cells, rather longer than the calyx.—Gathered in Hispaniola by Thierry de Menonville. A stove-plant at Paris, unknown in our collections. The stem is shrubby, branched, round, downy. Leaves three inches long, strongly scented, bordered with tooth-like serratures, and furnished with one or two slight lobes at each side. Flowers yellow, an inch broad, on long, simple, axillary stalks.

S. periptera. Shuttlecock Sida. Sims in Curt. Mag. t. 1644.—Leaves heart-shaped, ferrated, pointed, downy on both sides, somewhat angular; the upper ones halberd-shaped. Panicle racemose. Petals emarginate, nearly erect, shorter than the stamens. Capsule without beaks.—Supposed to be a native of Mexico. It flowers nearly throughout the year, in the collection of John Walker, esq. of Arno's grove, Southgate; but we are not informed whether it is a greenhouse or stove-plant. The stem is tall and shrubby, with round hispid branches. Leaves green, alternate, stalked, distant; the upper ones elongated, and deeply lobed. Flowers elegant, bright scarlet, near an inch long, of a shuttlecock form, as the inversely heart-shaped, oblong petals spread but very little. The column of stamens rises considerably above them.

S. hastata. Halberd-leaved Mexican Sida. Willd. n. 89. Ait. n. 33. Andr. Repos. t. 588. Curt. Mag. t. 1541. (*S. cristata* β; Linn. Sp. Pl. 964. *Anoda hastata*; Cavan. Diff. 38. t. 11. f. 2.)—Lower leaves heart-shaped, lobed; upper hastate. Stalks axillary, solitary, single-flowered, longer than the leaves. Petals obovate, spreading, entire. Native of Mexico. Its seeds were brought from Spain by the late marchioness of Bute. An annual or biennial stove plant, which may be raised on a hot-bed early in the spring, and planted out in the open border. It is scarcely however likely to be added to the list of tropical annuals, generally so cultivated, being much inferior in beauty to many other plants, of the Mallow tribe, that are quite hardy. Its flowers are light purplish-blue, about an inch wide, on long, straggling stalks. The divisions and shape of the leaves vary greatly. The valves of the capsule have no beaks.

S. cristata. Crested Sida. Linn. Sp. Pl. 964. Willd. n. 90. Curt. Mag. t. 330. (*Anona triloba*; Cavan. Diff. 39 and 55. t. 10. f. 3.)—Leaves crenate, pointed; the lower ones angular; upper hastate. Stalks axillary, solitary, single-flowered, longer than the leaves. Petals inversely heart-shaped, thrice the length of the calyx.—Native of Mexico; long since known in our gardens. We have however ascertained the synonym of Cavanilles, by seeds received from himself, and raised by the late lady Amelia Hume, in whose stove this plant flowered in July 1806. It may probably succeed, as Mr. Curtis observes, if raised on a hot-bed and planted out in a flower-border. This is distinguished from the last by its very large crimson flowers, rendering it far more worthy of cultivation. Few plants vary more in the shape of their foliage, so that we are satisfied of the *S. Dilleniana*, Willd. n. 91. Ait. n. 34, figured in Cavanilles, t. 11. f. 1, and in Dill. Hort. Elth. t. 2, being a mere variety; so little defined indeed, that we can hardly distinguish it as even such.

SECT. 7. *Leaves lobed, palmate, or compound.*

S. triloba. Three-lobed Cape Sida. Cavan. Diff. 11. t. 1. f. 11, very bad; and 274. t. 131. f. 1. Willd. n. 92. Thunb. Prodr. 117. Jacq. Hort. Schonbr. v. 2. 9. t. 142. —Leaves heart-shaped, toothed, with three or five lobes; the middle one longest and sharpest. Stalks axillary, solitary,

tary, single-flowered, longer than the leaves. Lobes of the capsule obtuse.—Native of the Cape of Good Hope. The stem is shrubby, much branched, widely spreading. Leaves one and a half or two inches wide. Flowers small, white, inferior in beauty to those of the *Malva fragrans* or *capensis*, to which this plant is strictly allied in habit and every character, except the want of an outer calyx.

S. ternata. Ternate-leaved Cape Sida. Linn. Suppl. 307. Willd. n. 93. Thunb. Prodr. 118.—“Leaves ternate; leaflets lanceolate, distantly serrated.”—Gathered by Thunberg at the Cape. We have seen no specimen; but by the above scanty information, this should seem to differ from the last much as the two Cape Mallows, just mentioned, differ from each other.

S. pterosperma. Wing-seeded Jagged Sida. L’Herit. Stirp. 119. t. 57. Willd. n. 94. (*S. multifida*; Cavan. Diff. 25. t. 4. f. 2.)—Leaves with three deep, obtuse, sinuated lobes. Panicle much branched. Cells of the capsule numerous, each crowned with a double membranous wing.—Gathered by Dombey, in sandy ground at Lima. It was raised at Paris, but required great heat. The root is annual. Stem prostrate, much branched, a foot long, round, besprinkled with starry hairs. Leaves on long stalks, deeply divided, pinnatifid or waved, with blunt rounded lobes and segments. Flowers small, white, in terminal, paniced, rather hairy, clusters, each flower on a long stalk, and turned downwards. Capsule very peculiar, on account of the numerous, double, membranous, rounded wings, which form an orbicular crest on its summit.

S. jatrophoides. Physick-nut-leaved Sida. L’Herit. Stirp. 117. t. 56. Willd. n. 96. Ait. n. 35. (*S. palmata*; Cavan. Diff. 274. t. 131. f. 3. Jacq. Ic. Rar. t. 547.)—Leaves palmate, with deep, acute, pinnatifid lobes. Panicle many-flowered, hairy. Cells of the capsule without awns.—Native of Lima and Peru. Sent to Kew in 1787 by M. Thouin. An annual stove-plant, flowering in August, and distinguished by the deep lobes of its leaves, seven or more, variously and deeply sinuated, pinnatifid and cut, resembling those of the *Napaea*, to which genus we suspect this species may naturally belong; for L’Heritier speaks of the seeds as separating with difficulty from their cells. We are puzzled by his account of these cells being awned in the wild plant, but not in the cultivated one. But this difficulty may be solved by his having, like Cavanilles, originally confounded the present species with what he afterwards called *S. ricinoides*, in which the valves of the cells are strongly awned. We have a specimen of *jatrochoides* from L’Heritier himself, marked *ricinoides*. Yet the two are very distinct in their foliage as well as fruit.

SIDA, in Gardening, contains plants of the exotic, tender, herbaceous, perennial kind, of which the species chiefly cultivated are; the rhomb-leaved sida (*S. rhombifolia*); the great bindweed-leaved sida (*S. periplocifolia*); the triangular-stalked sida (*S. triquetra*); the broad-leaved sida (*S. abutilon*); the white-flowered sida (*S. alba*); and the heart-leaved sida (*S. cordifolia*).

Method of Culture.—These plants may be increased by seeds, which should be sown upon a moderate hot-bed in the early spring, or in pots deposited in them. In the first case, when the plants have attained some growth, they should be removed to another hot-bed, and be set out four inches apart each way, or into separate pots, replunging them in the hot-bed, being shaded till they have taken new root; a large proportion of free air being admitted in fine weather, and also frequent waterings: they should afterwards be gradually hardened to bear the open air in the summer season.

Some of them may also be raised from offsets and cuttings, planted in pots in the summer season.

It may be noticed that the fourth sort is sufficiently hardy to bear the open air: the seeds should be sown where the plants are to remain, as they do not bear transplanting well. It is an annual plant.

As some of the species do not flower till the second year, of course they should be placed in the stove in the autumn, and be managed during the winter as other tender exotic plants of the same nature.

Most of these afford ornament among other potted plants in the stove, and the fourth sort in the borders and other parts of pleasure-grounds.

SIDA, in *Ancient Geography*, a town of Asia, in Pamphylia, upon the sea-coast, near the mouth of the river Eurymedon. Ptolemy.—Also, a town of Greece, in the Peloponnese, which took its name from one of the daughters of Danaus, according to Pausanias.

SIDACA, a town of Asia Minor, in Lycia. Steph. Byz.

SIDALA, a town of Asia, in Armenia Major. Ptol. SIDAMER, in *Geography*, a kingdom of the island of Java, on the S. coast, bounded on the W. by Bantam, on the N. by Jacatra, on the E. by Kandang Wese, and on the S. by the sea.

SIDASIVA, in *Mythology*, a name of the Hindoo god Siva, the prefixed epithet being one of reverence. It is not often used, though it frequently occurs in the Siva-purana.

SIDATSCHOW, or ZYDACZOW, in *Geography*, a town of Austrian Poland, in Galicia; 35 miles S. of Lemberg. N. lat. 49° 16'. E. long. 24° 19'.

SIDBY, a town of Sweden, in the province of Wafra; 15 miles S. of Christinestadt.

SIDDAPOUR, a town of Hindoostan, in Mysore; 10 miles S.W. of Periapatam.

SIDDINGHAUSEN, a town of Westphalia, in the bishopric of Paderborn; 3 miles S.S.W. of Buren.

SIDDO, a harbour on the W. coast of Sumatra. N. lat. 5° 8'. E. long. 95° 27'.

SIDDOW, in *Agriculture*, a term provincially applied to peas that boil soft. It is employed in some districts, as Gloucestershire, to signify or denote such peas as boil freely, or in a ready manner, into a soft mass. Some sorts of lands only have the peculiar property or quality of raising or producing this kind, or those that possess such a capability. Upon them, therefore, those of the Charlton sort are mostly sown or planted in this intention. Soils of the calcareous description or quality are commonly capable of affording this boiling sort; but those that are of the clayey kind do not possess the same capability. This quality in peas is expressed by the terms boiling, making, and some others, in different other districts. See PEA.

SIDE, in *Ancient Geography*, a place of Asia Minor, in the Troade. Strabo.

SIDE, *Latus*, in *Geometry*. The side of a figure is a line making part of the periphery of any superficial figure. See FIGURE.

In triangles, the sides are also called legs. In a right-angled triangle, the two sides, including the right angle, are called catheti; and the third, the hypotenuse.

SIDE of a polygonal number is the number of the terms of the arithmetical progression that are summed up. See POLYGONAL Number.

SIDE of power is what we otherwise call the root, or radix.

SIDES of horn-works, crown-works, double tenailles, and the like out-works, are the ramparts and parapets which inclose

inclose them on the right and left, from the gorge to the head.

SIDE, Right, in *Conics*. See *LATUS Rectum*.

SIDE, Transverse. See *LATUS Transversum*.

SIDES of a Ship, are distinguished into the *starboard* and *larboard*; that is, into the right and left-hand side, when standing with the face towards the head of the vessel. See *STARBOARD* and *LARBOARD*.

SIDE, Broad, in *Sea Language*, is to fire all the guns on one side of the ship.

SIDE-Wind. See *WIND*.

SIDE-Grafting. See *ENGRAFTING*.

SIDE-Lays is a term made use of by huntsmen, when dogs are placed in the way, to be let slip at a deer, as he passes by.

SIDE-Saddle Flower. See *Hollow-leaved Sea LAVENDER*.

SIDE-Cuts, are the short lengths of canal by the sides of rivers, for condensing the navigation by mills, shallows, &c.

SIDE-Laying Ground, is that whose surface, as *A E L* (*Plate I. Canals*, figs. 2 and 3.) is lower on one side of the canal than on the other.

SIDE-Locks, or *Side-ponds*, are reservoirs or excavations by the side of a canal or lock, for retaining water. See *CANAL*.

SIDE-Puddle is often used to express the puddle-ditches, gullies or gutters that are formed like a wall within a canal-bank, for preventing breaks from the same.

SIDELING HILLS, in *Geography*, a range of hills in America, on the N.W. part of the state of Maryland.

SIDENA, in *Ancient Geography*, a town of Asia Minor, in Lycia. Steph. Byz.

SIDENA, or *Sidona*, a very fertile country of Asia, on the sea-coast, in the kingdom of Pontus, in which, according to Strabo, were some strong places, besides a town of the same name.—Also, a town of Asia Minor, in the Troade, upon the Granicus; which was ruined in the time of Strabo.

SIDENI, a people of Germany, who occupied the banks of the Oder.—Also, a people of Arabia Felix. Ptol.—Also, a people of the Cappadocian Pontus, who inhabited the country of Sidenia. Pliny.

SIDENI Sinus, a gulf of Asia Minor, upon the Thracian Bosphorus, near the Euxine sea. This gulf was formed by the promontory Ancyreum and by that of Pfonion.

SIDENSIO, in *Geography*, a town of Sweden, in Angermanland; 40 miles N. of Hernofand.

SIDEPATTY, a town of Bengal; 12 miles N.W. of Midnapour.

SIDERATIO, in *Medicine*, from *sidus*, a planet, because violent and sudden maladies were ascribed to the influence of the stars, a term which has been applied to several diseases of that character. It has been principally used to signify *apoplexy*, or a sudden *palsy*; but it has been applied by others to *mortification*, or *sphacelus* of a limb; and by some to *erysipelas* of a limb, which is vulgarly called a *blast*.

SIDERATION, the blasting or blighting of trees, plants, &c. by eastern winds, excessive heat, drought, or the like causes. See *BLIGHT*.

SIDERIA, in *Natural History*, the name of a genus of crystal. The word is derived from the Greek *σιδηρος*, iron, and is used to express crystals altered in their figure by particles of that metal. These are of a rhomboidal form, composed only of six planes.

Of this genus there are four known species. 1. A colourless, pellucid, and thin one, found in considerable quantities among the iron ores of the forest of Dean, in Gloucestershire, and in other the like places. 2. A dull, thick, and brown one, not uncommon in the same places with the former. And, 3. A black and very glossy kind, a fossil of very great beauty, found in the same place with the others, as also in Leicestershire and Suffex. Hill.

SIDERAL YEAR. See *YEAR*.

SIDERAL Day is the time in which any star revolves from the meridian to the meridian again; viz. 23 hours, 56 minutes, 4 seconds, 6 thirds of mean solar time. There are 366 sidereal days in a year, or in the time of 365 diurnal revolutions of the sun. The first column of the following table is the number of revolutions of the stars; the others next are the times in which these revolutions are made, as shewn by a well-regulated clock; and those on the right hand shew the daily accelerations of the stars, that is, how much any star gains upon the time shewn by such a clock, in each revolution.

Revol. of the Stars.	Times in which these Revolutions are made.						Accelerations of the Stars.				
	D.	H.	M.	S.	'''	'''	H.	M.	S.	'''	'''
1	0	23	56	4	6	0	0	3	55	54	0
2	1	23	52	8	12	1	0	7	51	47	59
3	2	23	48	12	18	1	0	11	47	41	59
4	3	23	44	16	24	2	0	15	43	35	58
5	4	23	40	20	30	2	0	19	39	29	58
6	5	23	36	24	36	3	0	23	35	23	57
7	6	23	32	28	42	3	0	27	31	17	57
8	7	23	28	32	48	4	0	31	27	11	56
9	8	23	24	36	54	4	0	35	23	5	56
10	9	23	20	41	0	5	0	39	18	59	55
11	10	23	16	45	6	5	0	43	14	53	55
12	11	23	12	49	12	6	0	47	10	47	54
13	12	23	8	53	18	6	0	51	6	41	54
14	13	23	4	57	24	7	0	55	2	35	53
15	14	23	1	1	30	7	0	58	58	29	53
16	15	22	57	5	36	8	1	2	54	23	52
17	16	22	53	9	42	8	1	6	50	17	52
18	17	22	49	13	48	9	1	10	46	11	51
19	18	22	45	17	54	9	1	14	42	5	51
20	19	22	41	22	0	10	1	18	37	59	50
21	20	22	37	26	6	10	1	22	33	53	50
22	21	22	33	30	12	11	1	26	29	47	49
23	22	22	29	34	18	11	1	30	25	41	49
24	23	22	25	38	24	12	1	34	21	35	48
25	24	22	21	42	30	12	1	38	17	29	48
26	25	22	17	46	36	13	1	42	13	23	47
27	26	22	13	50	42	13	1	46	9	17	47
28	27	22	9	54	48	14	1	50	5	11	46
29	28	22	5	58	54	14	1	54	1	5	46
30	29	22	2	3	0	15	1	57	56	59	45
40	39	21	22	44	0	19	2	37	15	59	41
50	49	20	43	25	0	24	3	16	34	59	36
100	99	17	26	50	0	48	6	33	9	59	12
200	199	10	53	40	1	37	13	6	19	58	23
300	299	4	20	30	2	25	19	39	29	57	35
360	359	0	24	36	2	54	23	35	23	57	6
365	364	0	4	56	32	56	23	55	3	57	4
366	365	0	1	0	38	57	23	58	59	21	3

This table will not differ the 279,936,000,000th part of a second of time.

If the equinoctial points were at rest in the heavens, there would be exactly 366 revolutions of the stars from the meridian

dian to the meridian again in 365 days. But the equinoctial points go backward, with respect to the stars, at the rate of fifty seconds of a degree in a Julian year; which causeth the stars to have an apparent progressive motion eastward fifty seconds in that time. And, as the sun's mean motion in the ecliptic is only 11 signs 29 degrees 48 minutes 40 seconds 15 thirds, in 365 days, it is plain, that at the end of that time he will be 14 minutes 19 seconds 45 thirds short of that point of the ecliptic from which he set out at the beginning; and the stars will be advanced 50 seconds of a degree with respect to that point.

Consequently, if the sun's centre be on the meridian with any star on any given day of the year, that star will be $14^{\circ} 19' 45'' + 50''$, or $15^{\circ} 9' 45''$ east of the sun's centre, on the 365th day afterward, when the sun's centre is on the meridian; and therefore that star will not come to the meridian on that day till the sun's centre has passed it by 1 minute 0 second 38 thirds 57 fourths of mean solar time; for the sun takes so much time to go through an arc of $15^{\circ} 9' 45''$; and then, in 365 days 0 hour 1 minute 0 second 38 thirds 57 fourths, the star will have just completed its 366th revolution to the meridian.

This table was calculated by Mr. Ferguson; and it is the only table of the kind in which the recession of the equinoctial points has been taken into the calculation.

SIDERITE, in *Mineralogy*, a name given by Bergman to a supposed peculiar metallic substance, which is the principal cause of the brittleness of certain kinds of bar iron. It has since been discovered to be phosphate of iron.

SIDERITES, a name which some authors give to the load-stone. See **MAGNET**.

SIDERITIS, in *Botany*, supposed to be the *σίδηρις* of the Greeks, of which Dioscorides describes three species, all celebrated for staunching blood, and healing wounds. The first quality they might very well possess, being, according to his account, rough herbs, akin to *Marrubium*, in which also there might be somewhat of an astrigent or tonic quality. They answer indeed to the general idea of the genus to which modern botanists have applied the name, whose etymology is to be sought in *σίδηρος*, iron; but whether it alludes to that metal as the cause of wounds, to the rusty colour of the flowers, as De Theis imagines, or to any other circumstance, nothing but conjecture can be offered.—Linn. Gen. 290. Schreb. 387. Willd. Sp. Pl. v. 3. 63. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 3. 384. Sm. Prodr. Fl. Græc. Sibth. v. 1. 400. Juss. 113. Tourn. t. 90. Lamarck Illustr. t. 505.—Clafs and order, *Didymia Gymnospermia*. Nat. Ord. *Verticillata*, Linn. *Labiata*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, oblong, cut nearly half way down into five acute, almost equal, segments. *Cor.* of one petal, nearly equal; tube cylindrical, oblong; throat oblong, somewhat cylindrical; upper lip erect, narrow, divided; lower in three segments, of which the lateral ones are most acute, and scarcely so large as the upper lip, the middle one roundish. *Stam.* Filaments four, within the tube of the corolla, and shorter than the throat, two of them smaller than the rest; anthers roundish, two of them with two distinct lobes. *Pist.* Germen four-cleft; style thread-shaped, rather longer than the stamens; stigmas two; the uppermost cylindrical, concave, abrupt; the lower membranous, shortest, sheathing the other. *Peric.* none, the seeds being lodged in the base of the calyx. *Seeds* four.

Eff. Ch. Calyx five-cleft. Corolla ringent; its upper lip erect, divided; lower deeply three-cleft. Stamens

within the tube of the corolla. One stigma shorter, embracing the other.

1. *S. canariensis*. Canary Iron-wort, or Sage-tree. Linn. Sp. Pl. 801. Ait. n. 1. Jacq. Hort. Vind. v. 3. 18. t. 30. (*Stachys amplifolius verbasci foliis, floribus albis, &c.*; Pluk. Almag. 356. Phyt. t. 322. f. 4.)—Shrubby and villous. Leaves oblong-heart-shaped, acute, stalked. Spikes simple, whorled, drooping before flowering. Branches spreading. Calyx awned.—Native of Madeira, and the Canary islands. Cultivated in our green-houses 120 years ago, and still preserved in general collections, flowering throughout the summer. The *stem* and *stalks* are clothed with soft, dense, white, velvet-like pubescence. *Leaves* green above, elegantly edged with white, finely crenate, rather shaggy; more thickly clothed beneath. *Whorls* dense, numerous, accompanied by diminished leaves, so as to form a long *spike*, drooping while young, but destitute of proper *bractæas*. *Flowers* very numerous, white, with a wide orbicular mouth, and shortish limb, whose upper segment hardly answers to the generic character, being notched, but not cloven in the middle.

2. *S. candicans*. Mullein-leaved Iron-wort. Ait. n. 2. Willd. n. 2; excluding the synonym.—Shrubby and downy. Leaves densely downy, ovato-lanceolate, taper-pointed; heart-shaped at the base; snow-white beneath. Spikes compound. Whorls remote, each of about eight flowers. Calyx obtuse, pointless.—Native of Madeira; long known in the gardens of England, as well as Holland; flowering from April to July, and sheltered in the greenhouse in winter, with moderate supplies of water. Akin to the preceding, with which Linnæus confounded it; but differing in the peculiar dense snow-white clothing of the *leaves*, which almost resemble thick white leather. The *flowers* are larger, and fewer, with an obtuse, very woolly, *calyx*, destitute of awns, and grow in compound, whorled, leafy *spikes*. The inflorescence is so different from Commelin's figure, cited by Aiton and Willdenow, that we rather follow Linnæus in applying that synonym to the following species; though not quite without a suspicion of its really belonging to *S. canariensis*.

3. *S. cretica*. Cretan Iron-wort. Linn. Sp. Pl. 801, excluding the reference to Tournefort. Willd. n. 3. (*Stachys canariensis frutescens, verbasci foliis*; Commel. Hort. v. 2. 197. t. 99?)—Shrubby and downy. Leaves densely downy, heart-shaped, bluntish, broadly crenate, on long stalks; snow-white beneath. Spikes simple, whorled. Calyx obtuse, pointless.—Native of Crete and Greece. This has the very dense white pubescence of the last species, but differs in its larger, blunter, more strongly crenate *leaves*, and especially its solitary unbranched leafless *spikes*. The whorls consist each of eight or more *flowers*, whose *calyx*, though less woolly, nearly agrees with the preceding, being totally unlike the spinous-pointed *calyx* of *S. canariensis*. If Commelin's plate had been executed with any care, this circumstance would have determined his synonym, which certainly belongs either to our first or third species, and not to the second.

4. *S. syriaca*. Syrian Iron-wort. Linn. Sp. Pl. 801. Willd. n. 7. Ait. n. 6. Sm. Fl. Græc. Sibth. t. 550, unpublished. (*S. cretica tomentosa candidissima, flore luteo*; Tourn. Cor. 12. *Stachys*; Ger. Em. 695. *S. lychnoides incana angustifolia, flore aureo, italica*; Barrel. Ic. t. 1187.)—Shrubby, clothed with woolly down. Leaves elliptic-lanceolate, nearly entire. Whorls axillary, many-flowered. Calyx acute, without awns.—Native of Italy, Crete, and various parts of the Levant. The root is pe-

SIDERITIS.

rennial and woody. *Stems* erect, mostly simple, herbaceous, a foot high, clothed, like the whole of the herbage, with long, soft, silky, dense, white wool. The radical and lower *stem-leaves* are obovate, or elliptic-lanceolate, obscurely crenate; those which accompany the flowers are generally much shorter, ovate, and acute; sometimes they nearly resemble the rest of the foliage, evincing that they are not *bracteas*, as some esteem them, but real leaves. *Whorls* about eight, a little distant, each of six bright yellow *flowers*. *Calyx* obovate, densely woolly, with five sharp teeth, but no awns or points. *Corolla* twice as long, contracted at the mouth, downy externally, its segments acute, all entire.

5. *S. taurica*. Tartarian Iron-wort. Willd. n. 8. ("S. *fyriaca*; Pallas Nov. Act. Petrop. v. 10. 312.")—Somewhat shrubby, downy. Leaves lanceolate, crenate. Whorls crowded. Floral leaves heart-shaped, pointed, reticulated with elevated veins.—Native of Tartary. The branches are a foot long, subdivided, clothed with white down. Radical leaves stalked, *stem-leaves* sessile, all crenate, rugged with veins, and covered with fine wooliness; the floral ones roundish-ovate, pointed, ribbed, reticulated, shorter than the *calyces*; woolly, like the other leaves, till the flowers are past, when they become nearly smooth, except the edges. *Corolla* yellow. Willd.

6. *S. diffrans*. Distant-whorled Iron-wort. Willd. n. 9.—"Somewhat shrubby, hoary. Leaves lanceolate, acute, entire. Whorls distant. Floral leaves heart-shaped, sharp-pointed, reticulated with elevated veins."—Supposed to be a native of the Levant. Willdenow obtained it from some old herbarium, with the name of *Sideritis foliis conjugatis amplexicaulibus rigidis*. He describes it as like the former, but different, having acute, entire, less downy leaves, the stem alone being villous. *Whorls* very distant, accompanied by nearly smooth leaves, with sharp points. Tube of the *corolla* longer than the *calyx*; the middle segment of its lower lip obtuse, but not emarginate. We are unacquainted with any thing answering to this description.

7. *S. perfoliata*. Perfoliate Iron-wort. Linn. Sp. Pl. 802. Willd. n. 10. Ait. n. 7. Prodr. Fl. Græc. n. 1330. (*S. orientalis*, *phlomidis folio*; Tourn. Cor. 12?)—Herbaceous, rough with bristly hairs. Upper leaves ovato-lanceolate, obscurely toothed, clasping the stem; floral ones heart-shaped, sharp-pointed, reticulated, fringed.—Native of the Levant. Dr. Sibthorp gathered it in some part of Greece, or the neighbouring islands, but omitted to mark the precise spot. No figure is extant of this species. The herbage is green, hairy, and bristly, not downy. Leaves reticulated with copious veins; the floral ones crowded, short, and broad, with spinous points, their disk pale, and semi-pellucid. Flowers six in a whorl. *Calyx* tubular, round, without angles, glandular and hairy; its teeth long, erect, ribbed, spinous. Linnæus says the *corolla* is white, with some reddish veins.

8. *S. ciliata*. Fringed Japan Iron-wort. Thunb. Jap. 245. Willd. n. 11.—Herbaceous, villous. Leaves stalked, ovate, serrated, dotted; the floral ones orbicular, ribbed, fringed.—Native of Japan. Stem a foot high, or more, square, erect, branched. Leaves hardly an inch long, acute; pale beneath; marked on the upper side with depressed dots. Footstalks rather shorter than the leaves. Spikes terminal (whorled?) lanceolate, erect, a finger's length. Floral leaves imbricated, pointed, not spinous. Thunb.

9. *S. montana*. Mountain Iron-wort. Linn. Sp. Pl. 802. Willd. n. 4. Ait. n. 3. Jacq. Austr. v. 5. 16.

t. 434. Sm. Fl. Græc. Sibth. t. 551, unpublished. (*S. montana*, parvo flore nigro-purpureo; Column. Ecphr. 198. t. 196.)—Herbaceous, decumbent, hairy. Leaves deflexed, spinous-pointed. *Calyx*-teeth spreading, spinous, nearly uniform.—Native of Italy and the Levant. A hardy annual, cultivated by Miller in Chelsea garden, where it still springs up spontaneously every year, flowering in June and July. The stem is branched from the bottom, hairy, rather rigid, a foot long, diffuse, clothed all the way up with ovate, concave, deflexed, slightly notched, green, hairy leaves, each accompanied by a whorl of six flowers. The *calyx* is tubular, very hairy, except its lip, which spreads in two divisions; the upper three-lobed, with three spinous teeth; the lower deeply divided, rather narrower, with two; mouth hairy. *Corolla* with a yellow slender tube, the length of the *calyx*; limb various, sometimes very small, yellow, bordered with brown on all sides; sometimes, as in our garden plants, and in Dr. Sibthorp's Greek specimens, the upper lip only is small and brown, the lower dilated, yellow, obtusely three-lobed. This does not at all answer to the figure and description of Columna. We are not without a suspicion of two species being here confounded, and yet we are not able to trace a permanent distinction between any of the specimens we have seen.

10. *S. romana*. Simple-beaked Iron-wort. Linn. Sp. Pl. 802. Willd. n. 6. Ait. n. 5. Cavan. Ic. v. 2. 69. t. 187. Sm. Fl. Græc. Sibth. t. 552, unpublished. (*Sideritis* genus spinosis verticillis; Bauh. Hist. v. 3. 428.)—Herbaceous, decumbent, hairy. *Calyx*-teeth spinous; the uppermost largest, solitary, ovate.—Gathered by Cherler first near Rome, whence the specific name. It has however been found in fields and waste ground in many other parts of the south of Europe. Dr. Sibthorp observed this plant to be common in Greece and the isles of the Archipelago, and we have suspected it might be the real *σινδρις* of Dioscorides, to whose description, as far as any thing can thence be determined, it answers well. The habit of the plant is much like the last, but the leaves are more notched, shorter and broader. Tube and upper lip of the *corolla* pale red; lower lip white, dilated as in the larger-flowered variety of the preceding. The most striking difference is found in the *calyx*, whose upper lip is erect, large, and ovate, the lower of four slender teeth, spreading downward.

11. *S. lanata*. Dark-flowered Iron-wort. Linn. Sp. Pl. 804. Willd. n. 20. Prodr. Fl. Græc. n. 1333. (*S. elegans*; Murray in Comm. Gott. for 1778. 92. t. 4. Willd. n. 5. *S. nigricans*; Lamarck Dict. v. 2. 168.)—Herbaceous, diffuse, hairy. Leaves elliptical, obtuse, crenate, without spines. *Calyx*-teeth spreading, spinous, hairy, nearly uniform.—Native of Egypt, Caria, and Palestine. Murray first described it at Gottingen, from garden specimens, without knowing whence they came. Nor was he blameable for not discovering his plant to be *S. lanata* of Linnæus, whose specific character, made from a starved wild specimen, is calculated to mislead those who had no other guide. Yet the great Swedish botanist appears, by his herbarium, to have rightly understood the cultivated plant of Murray, of which he possessed a very old and luxuriant morsel, apparently from some Dutch collection. This species is undoubtedly most akin to *montana* and *romana*, nor has it any real *bracteas*. The whorls, as in those, are all axillary, six-flowered. *Calyx* invetled all over with long silky hairs, its teeth tipped with spines, the upper one rather longer than the others, but all nearly equal in breadth. *Corolla* with a white tube; the front of the limb dark purplish-brown, nearly black, of a very striking appearance; its

its upper segment cloven; lower in three rounded lobes. The *leaves* vary greatly in size, but are rounded, pointlets, copiously and distinctly crenate; the lower ones stalked.

12. *S. incana*. Lavender-leaved Iron-wort. Linn. Sp. Pl. 802. Willd. n. 12. Ait. n. 8. Cavan. Ic. v. 2. 69. t. 186. (*Hyssopus montana verticillata major*; Barrel. Ic. t. 239. *H. verticillata minor*; Bocc. Mus. 77. t. 67. f. 2, the name transposed from t. 68. f. 2.)—Somewhat shrubby, downy, hoary. Leaves linear-lanceolate, entire. Bractæas ovate, palmate, with many spinous teeth.—Native of Spain. Cultivated by Miller in 1752, being tolerably hardy, flowering in July and August. The *habit* of the plant is much like Lavender. *Whorls* distant, four or five in each spike, with a pair of close, firm, ribbed, shortish bractæas, cut into many spinous segments, under every whorl. *Calyx* clothed with white cottony down; its teeth erect, spinous, nearly equal. *Corolla* twice as long as the calyx, yellow, white, or pale blue; both its lips dilated and spreading.

S. virgata, Desfont. Atlant. v. 2. 15, 125. Willd. n. 13, seems the very same plant, not even a variety. We venture to remove Barrelier's synonym, cited by Desfontaines, to the following, as Willdenow has done.

13. *S. glauca*. Slender Glaucous Iron-wort. Cavan. Ic. v. 2. 68. t. 185. Willd. n. 14. (*Hyssopus montana verticillata minor*; Barrel. Ic. t. 240.)—Herbaceous, glaucous, somewhat downy. Leaves linear-spatulate, entire. Bractæas wedge-shaped, palmate, spinous.—Native of Valencia. Very nearly akin to the last, but said to be herbaceous, and less downy. The *flowers* appear to be smaller, and the bractæas are considerably so. It may nevertheless be merely a variety.

14. *S. hyssopifolia*. Hyssop-leaved Iron-wort. Linn. Sp. Pl. 803. Willd. n. 15. Ait. n. 9. (*S. alpina*; Villars Dauph. v. 2. 373. *S. alpina hyssopifolia*; Ger. Em. 696. *S. montana*, &c.; Barrel. Ic. t. 171, 172.)—Leaves lanceolate, smooth, nearly entire. Bractæas heart-shaped, with spinous teeth, as long as the calyx.—Native of the mountains of Switzerland, Dauphiny, Italy, and the Pyrenées. Cultivated by Gerarde in his garden, and still preserved in curious or general collections, being a hardy perennial, flowering throughout the summer and autumn. The *stems* are somewhat woody, throwing up many leafy squarish branches, a span high, hairy at the two opposite sides, in lines crossing each other at every joint. *Leaves* numerous, opposite, stalked, green, elliptic-lanceolate, two or three of the upper ones only occasionally toothed. *Whorls* more or less crowded into an ovate or oblong, solitary, terminal spike, each whorl accompanied by two broad, reticulated, hairy bractæas, with strong spinous serratures. *Calyx-teeth* long, spinous, erect, nearly equal. *Corolla* straw-coloured, with two dilated lips, longer than the calyx.

15. *S. scordioides*. Scollop-leaved Iron-wort. Linn. Sp. Pl. 803. Willd. n. 16. Ait. n. 10. Villars Dauph. v. 2. 374. Ger. Em. 696. (*S. montana scordioides glabra*; Barrel. Ic. t. 343.)—Leaves lanceolate, somewhat hairy, distantly toothed. Bractæas ovate, with spinous teeth, as long as the calyx.—Native of the mountains of Switzerland and France. Very nearly resembling the last in every essential character, especially the hairy lines on the *stem*, though usually a larger plant, with more constantly toothed *leaves*. The degree of hairiness on the leaves is somewhat variable.

16. *S. spinosa*. Spinous-leaved Iron-wort. Vahl. Symb. v. 1. 41. Willd. n. 17. Lamarck Dict. v. 2. 169. (*S. subspinosa*; Cavan. Ic. v. 3. 5. t. 209.)—Leaves lanceolate, pointed, with strong spinous teeth, as well as the reticulated heart-shaped bractæas. Stem equally hairy on all

sides.—Native of mountains in Spain, flowering in June. We received it from the late abbé Cavanilles. The habit of the plant, as well as its *inflorescence* and *flowers*, all seem to agree with the two last; but the sharpness of the *leaves*, and their strong spinous teeth, as well as the more strongly reticulated, and deeply cut, bractæas, indicate an essential difference, confirmed perhaps by the pubescence of the *stem*, which is generally, though sparingly, diffused, not collected into two dense opposite lines. The *leaves* moreover are very strongly ribbed.

17. *S. hirsuta*. Hairy Procumbent Iron-wort. Linn. Sp. Pl. 803. Willd. n. 18. Ait. n. 11. (*S. tertia*; Clus. Hist. v. 2. 40. Tetralit herbariorum; Lob. Ic. 523. Herba judaica Lobelii; Ger. Em. 690.)—Leaves oblong, obtuse, strongly toothed. Bractæas with spinous teeth. Stems hairy all round, decumbent at the base.—Native of Spain, Italy, and the south of France.—Very much akin to the three last in its *flowers*, bractæas, &c. but more hairy. The form and teeth of the *leaves* agree with *scordioides*, a hairy variety of which, we suspect, is sometimes taken for the true *hirsuta*. The latter however appears essentially to differ, in having the copious hairiness of its *stem* equally diffused all round, not collected into decussating lines. The *whorls* vary much in being crowded or remote, and are very hairy. The wooden cut cited above, which is the same in all the three authors, does not well represent the *inflorescence*, nor distinguish the bractæas from the *leaves*. It seems taken from an axillary-whorled species, like *montana*, *romana*, &c.

18. *S. ovata*. Ovate Peruvian Iron-wort. Cavan. Ic. v. 1. 36. t. 48. Willd. n. 19.—Herbaceous, downy. Leaves stalked, elliptical, obtuse, crenate. Whorls crowded. Bractæas ovate, spinous-toothed, imbricated in four rows.—Native of Peru. It flowered in the gardens of Madrid, in July. The *root* is fibrous and perennial. *Stems* scarcely a foot high, square, slightly hairy. *Leaves* about two inches long, on stalks about the same length; rough on the upper side, with hairs proceeding from minute tubercles; smooth and shining beneath. *Spike* solitary, terminal, about three inches long, quadrangular. Bractæas crowded, in four rows, ovate, acute, rigid, spreading, beset with strong spinous serratures. *Flowers* six in a whorl, three to each bractæa. *Calyx* with five slender, sharp, nearly equal teeth. *Corolla* yellowish-white; its upper lip entire, lower three-lobed, the middle lobe three-cleft.

SIDERITIS, in Gardening, contains plants of the under-shrubby, and shrubby exotic kind, of which the species cultivated are, the Canary iron-wort (*S. canariensis*); the Cretan iron-wort (*S. cretica*); and the sage-leaved iron-wort (*S. syriaca*). But there are other species that may be cultivated for the sake of variety.

Method of Culture.—These plants may be increased by seeds, cuttings, and layers. The seeds should be sown in pots in the spring, plunging them in a moderate hot-bed: when the plants have had some growth, they should be removed into separate small pots, filled with light mellow mould, being afterwards treated as other shrubby greenhouse plants. The cuttings and layers may be planted out or laid down in the summer season, and when sufficiently rooted managed as the other sorts. Also, the third sort may be increased by planting the slipped heads, either in pots or in a shady border, to be afterwards removed into pots for protection in the winter in a frame.

They afford variety in green-house collections, among other evergreen potted plants of similar growths.

SIDERNO, in Geography, a town of Naples, in Calabria Ultra; 48 miles S. of Catanzaro.

SIDERO-CAPSA, a town of European Turkey, in Macedonia; 32 miles E.S.E. of Saloniki.

SIDEROCHITA, in *Natural History*, a class of crustated ferruginous bodies, of a moderately firm and compact texture, composed of ferruginous mixed with earthy matter, and formed of repeated incrustations, making so many coats or crusts round a softer or harder nucleus, or round loose earths, or an aqueous fluid.

Under this class are comprehended the *emberepyra*, *heteropyra*, *geodes*, and *enhydri*.

SIDERODENDRUM, in *Botany*, from *σιδηρος*, iron, and *δενδρον*, a tree, a name given by Schreber to the *Sideroxyloides* of Jacquin, which the latter had so called for a while only, till he should be more certain of the genus, by ascertaining the true nature of the fruit. This Schreber has determined; and the name he has chosen alludes to the hardness of the wood, known to the French in Martinico by the appellation of *Bois de fer*, or Iron-wood. The analogy of the neighbouring genus *Sideroxylum* is also thus kept in mind.—Schreb. Gen. 71. Willd. Sp. Pl. v. 1. 612. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 1. 245. (*Sideroxyloides*; Jacq. Amer. 19.)—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Dumoseæ*, Linn. *Sapotæ*, Juss.

Gen. Ch. Cal. Perianth superior, of one leaf, minute, with four acute teeth. Cor. of one petal; tube cylindrical, incurved, many times longer than the calyx; limb in four oblong, obtuse, flat, reflexed segments, half the length of the tube. Stam. Filaments four, very short, inserted under the divisions of the limb; anthers oblong, erect. Pist. Germen roundish, inferior; style thread-shaped, the length of the tube of the corolla; stigma oblong, obtuse, thickish. Peric. Berry two-lobed, crowned with the calyx, two-celled, with a transverse partition. Seeds solitary, convex and rugged at the outer side, flat on the inner, bordered, attached to the partition.

Eff. Ch. Corolla of one petal, falver-shaped. Calyx with four teeth. Berry inferior, two-lobed, two-celled. Seeds solitary.

1. *S. triflorum*. Three-flowered Iron-tree. Willd. n. 1. Ait. n. 1. (*Sideroxyloides ferreum*; Jacq. Amer. 19. t. 175. f. 9. *Sideroxylum americanum*, five lignum duritie ferum æmulans; Pluk. Almag. 346. Phyt. t. 224. f. 2.)—Native of mountainous woods, in the islands of Martinico, Montserrat, Barbadoes, &c. A tall branching tree. Leaves opposite, stalked, ovato-lanceolate, acute, entire, shining, six inches long. Flower-stalks axillary, very short, mostly three-flowered, chiefly on the older and leafless branches. Flowers small and slender, about half an inch long, rose-coloured at the outside, white within.—Mr. Ryan observed the corolla to be often changed, possibly by the attack of some insect, into an oblong, hollow, fleshy bag, pointed at the top, half an inch in length, resembling a fruit.

SIDEROMANTIA, *Σιδερομαντία*, in *Antiquity*, a kind of divination performed with a red-hot iron, upon which they laid an odd number of straws, and observed what figures, bendings, sparkings, &c. they made in burning.

SIDEROXYLUM, in *Botany*, from *σιδηρος*, iron, and *ξύλον*, wood, alluding to its hardness, was first correctly applied to the present genus, (as Dillenius observes,) in the *Paradisi Batavi Prodrum*, 375, subjoined to Sherard's *Schola Botanica*; see SHERARD.—Linn. Gen. 104. Schreb. 141. Willd. Sp. Pl. v. 1. 1089. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 2. 13. Dill. Elth. 357. Jacq. Amer. 55. Juss. 151. Lamarck Illustr. t. 120. Gært. Fil. Suppl. t. 202.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Dumoseæ*, Linn. *Sapotæ*, Juss.

Gen. Ch. Cal. Perianth inferior, small, erect, in five segments, permanent. Cor. of one petal, wheel-shaped, in five concave, erect, roundish segments, with a little pointed inflexed scale, at the base of each segment. Stam. Filaments five, awl-shaped, the length of the corolla, into which they are inserted alternately with the scales; anthers oblong, incumbent. Pist. Germen roundish, superior; style awl-shaped, the length of the flaments; stigma simple, obtuse. Peric. Drupa roundish, pointed, of one cell. Seed. Nut ovate, large, of one cell.

Eff. Ch. Corolla five-cleft. Stamens inserted into the corolla, with five scales between. Stigma simple. Drupa superior.

Obs. SERSALISIA of Mr. Brown, see that article, differs in having a berry, with from one to five seeds; but in the former case we know not how to distinguish it from the present genus. *Sideroxylum spinosum*, Linn. Sp. Pl. 279, according to Mr. Brown, constitutes a very distinct genus of the same natural order.

1. *S. mite*. Harmless Iron-wood. Linn. Syst. Nat. ed. 12. v. 2. 178. Willd. n. 1. Jacq. Coll. v. 2. 249. (*S. mas inerme*; Mill. Ic. t. 299.)—Thorns none. Leaves acute.—Native of Africa. Jacquin describes his plant, which appears to be the same with Miller's, as an elegant evergreen tree from the Cape of Good Hope, flowering abroad in summer, sheltered in the greenhouse in winter. The leaves are scattered, stalked, lanceolate, pointed, entire, coriaceous, smooth; of a shining deep green above; paler beneath. Footstalks short, purple. Flowers white, on simple or branched axillary stalks.—We know nothing of this species but from the above authors. Linnæus defines his plant as having sessile flowers, but we find no specimen in his herbarium to ascertain what he meant.

2. *S. inerme*. Smooth Iron-wood. Linn. Sp. Pl. 278. Willd. n. 2. Ait. n. 1. Jacq. Coll. v. 2. 250. (*Sideroxyli primùm, dein coriæ indorum nomine data arbor*; Dill. Elth. 357. t. 265. f. 344.)—Thorns none. Leaves obovate, obtuse. Flower-stalks simple, round.—Native of the Cape of Good Hope. This shrub has long been known in the greenhouses of Europe, but has no beauty to boast, at least in its flowers, which are small and inconspicuous, growing on short, cylindrical, simple, axillary, generally aggregate stalks. The leaves are thick and coriaceous; rounded at the end, and often emarginate; somewhat tapering at the base; two or three inches long.

3. *S. melanophleum*. Laurel-leaved Iron-wood. Linn. Mant. 48. Willd. n. 3. Ait. n. 2. Jacq. Hort. Vind. v. 1. 29. t. 71. (*Padus foliis oblongis, fructu solitario*: Burm. Afr. 238. t. 84. f. 2. *Laurifolia africana*; Commel. Hort. v. 1. 95. t. 100.)—Thorns none. Leaves lanceolate. Flower-stalks simple, angular.—Native of the Cape of Good Hope. Communicated to Linnæus in 1761, by the late professor David Van Royen; and sent to Kew in 1783, by Mr. Græffer. This has dark purplish branches, and elliptic-lanceolate leaves, longer and more acute than the last. The flowers and their stalks are altogether of a palish red hue. Linnæus says the scales between the flaments are wanting, which Jacquin seems to confirm. The fruit is blue, the size of a pea.

4. *S. cymosum*. Cymose Iron-wood. Linn. Suppl. 152. Willd. n. 4. Thunb. Prodr. 36.—Thorns none. Leaves opposite, stalked, ovate. Cymes once or twice compound.—Found by Thunberg on the Table Mountain, at the Cape of Good Hope. A small shrub. We have seen no specimen.

5. *S. sericeum*. Silky Iron-wood. Ait. n. 3. Willd. n. 5. (*Sersalisia sericea*; Brown Prodr. Nov. Holl. v. 1.

530.)—Thorns none. Leaves ovate, obtuse; downy, like the calyx and flower-stalks, beneath. Corolla villous externally. Gathered by Mr. Brown, in the tropical part of New Holland; and by Sir Joseph Banks, who sent it to Kew in 1772, in New South Wales. The *style* is slender, hairy at the base.

6. *S. obovatum*. Obovate Iron-wood. (*Serfalisia obovata*; Brown *ibid.* n. 2.)—Leaves obovate; somewhat tapering at the base; scarcely silky beneath. Calyx nearly smooth. Corolla smooth. Style very short.—Gathered by Sir Joseph Banks, in the tropical part of New Holland.—In both these the *scales* between the *stamens* are lanceolate.

7. *S. argenteum*. Silvery Iron-wood. Thunb. Prodr. 36. Willd. n. 6.—“Thorns none. Leaves ovate, abrupt, downy. Flowers stalked.”—Found by Thunberg at the Cape.

8. *S. tomentosum*. Downy Iron-wood. Roxb. Coromand. v. 1. 28. t. 28. Willd. n. 7.—Thorns none. Leaves elliptic-oblong, with a blunt point; downy when young. Flower-stalks downy, axillary, aggregate, the length of the footstalks. Found chiefly on the tops of the mountains in Hindoostan, flowering during the hot season. This is a small tree. The leaves, three inches long and one broad, are smooth when full grown, but in a young state are covered with rusty down. Flowers numerous, of a dirty white. Fruit yellow, the size of a small cherry. Dr. Roxburgh says there are the rudiments of five seeds, though only one or two come to perfection. Hence it seems that the generic character, in that respect, is but precarious.

9. *S. lycioides*. Willow-leaved Iron-wood. Linn. Sp. Pl. 279. Willd. n. 8. Ait. n. 4. (*S. spinosum foliis deciduis*; Duham. Arb. v. 2. 260. t. 68. *Bumelia lycioides*; Pursh v. 1. 155.)

β. *S. decandrum*. Linn. Mant. 48. Willd. n. 9. Thorns axillary. Leaves elliptical, deciduous.—Native of North America. In shady woods from Carolina to Georgia, flowering in July and August. A small tree, with minute greenish flowers. Pursh. The branches are round, minutely warty; with strong, spreading, tapering, axillary, solitary thorns, three quarters of an inch long, accompanying the flowers, on the lower part of each branch. Leaves alternate, stalked, elliptic-oblong, about three inches in length, and more than one in breadth, entire, somewhat pointed, smooth, light green, finely reticulated with veins, deciduous. Flower-stalks axillary, several together, simple, about the length of the spines, and rather longer than the footstalks. Segments of the calyx deep, oval, concave, smooth, obtuse, unequal, folding over each other. Corolla twice as long as the calyx, but little spreading. We are unable to find any distinction between *S. lycioides* and *decandrum*. A specimen in the Linnæan herbarium from Kalm, under the latter name, has a pentapetalous flower, and is otherwise totally different from the species in question. Our description is taken from the specimen sent by Baron Munchausen to Linnæus, and marked *lycioides* by the latter, though described in his *Mantissa* under the appellation of *decandrum*.

10. *S. spinosum*. Thorny Iron-wood, or Argan. Linn. Sp. Pl. 279, excluding the synonym. Dryand. in Ait. Hort. Kew. n. 5. (*Elæodendrum Argan*; Willd. Sp. Pl. v. 1. 1148. *Rhamnus ficulus*; Linn. Syst. Nat. ed. 12. v. 3. 229.)—Thorns lateral. Leaves obovate-oblong, deciduous.—Native of Morocco. This has strong, almost conical, thorns. Leaves aggregate, stalked, obovate, simple, entire, smooth, about an inch long. Flowers in axillary tufts, nearly sessile. *Rhamnus ficulus pentaphyllos*, Bocc. Sic. 43. t. 21, must be a very different plant, having really

five leaflets on a common stalk, as Mr. Dryander observes in Tr. of Linn. Soc. v. 2. 225. This learned writer justly remarks, that many East Indian synonyms have erroneously been referred by Linnæus to his *Sideroxylum spinosum*; but he errs respecting the specimen under this name in the Linnæan herbarium, which is evidently the plant belonging to those synonyms, though not to the original specific character, being *Flacourtia sepiaria*, Willd. Sp. Pl. v. 4. 831. Roxb. Coromand. v. 1. t. 68.

The reader will perceive that there is considerable uncertainty about the species of this genus; nor is there less difficulty respecting its generic character, which is not yet clearly contrasted with that of *BUMELIA*; see that article.

SIDEROXYLUM, in *Gardening*, contains plants of the shrubby, evergreen, exotic kinds, of which the species cultivated are; the smooth iron wood (*S. inerme*); and the willow-leaved iron-wood (*S. lycioides*).

The wood of these shrubby plants having great solidity, hardness, and ponderosity, so as to sink in water, they have obtained the appellation of iron-wood.

Method of Culture.—These plants may be increased by seed procured from abroad, which should be sown in the spring in pots filled with fresh mould, and plunged in the tan-bed of the stove: when the plants have some growth, they should be removed into separate pots, and be replunged in the bark-bed. They are also sometimes raised from slit-layers and cuttings in the summer season; but they are tedious in forming roots in this way, and the plants are not so good in general.

The first sort is tender, affording variety in the stove; but the last is more hardy, and may sometimes be introduced in the shrubby borders in warm sheltered situations.

SIDERS, in *Geography*, a town of Switzerland, and principal place of a *dixain* in the Valais; 8 miles E. of Sion.

SIDES-MEN, properly called *synods-men*, or *quest-men*, persons who, in larger parishes, are appointed to assist the church-wardens in inquiring into the manners of inordinate livers, and in presenting offenders at visitations. In the ancient episcopal synods, the bishops were wont to summon divers creditable persons out of every parish to give information of, and to attest the disorders of clergy and people. These were called “*testes synodales*,” and in after-times they were a kind of impanelled jury, consisting of two, three, or more persons in every parish, who were upon oath to present all heretics and other irregular persons. These, in process of time, became standing officers in several places, especially in great cities, and hence were called “*synods-men*,” and by corruption “*sides-men*.” They are also sometimes called “*quest-men*,” from the nature of their office, in making *inquiry* concerning offences. And these sides-men or quest-men, by Can. 90, are to be chosen yearly in Easter-week, by the ministers and parishioners (if they can agree); otherwise to be appointed by the ordinary of the diocese. But for the most part this whole office is now devolved upon the *church-wardens*; which see. The sides-man’s oath, agreed upon by the civilians and common lawyers, is as follows: “You shall swear that you will be assidant to the church-wardens in the execution of their office, so far as by law you are bound: so help you God.” Gibb. 216

SIDEWAYS, in the *Manège*. To ride a horse sideways, is to passage him, or make him go upon two treads, one of which is marked by his shoulders, and the other by his haunches.

SIDGUR, in *Geography*, a town of Hindoostan, in Baglana; 50 miles E.N.E. of Bassein.

SIDI, in *Hindoo Mythology*, is the name of one of the two

two wives of Ganefa or Pollear, the god of prudence and policy. (See POLLEAR.) The name of the other was Budhi, and both were daughters of *Vishwarupa*; which see. Their names occur but seldom in Hindoo writings.

SIDI *Ben Tubu*, in *Geography*, a town of Algiers; 30 miles E.S.E. of Meliana.

SIDI *Efa*, a town of Algiers; 30 miles S. of Boujeiah.

SIDI *Gazi*, a town of Asiatic Turkey, in Natolia; 4 miles N.E. of Kiutaja.

SIDI *Ibrahim*, a town of Algiers; 30 miles W. of Tubnah.

SIDI *Medhab*, a town of Africa, in Tunis; 20 miles N. of Gabs.

SIDI *Shebri*, a town of Asiatic Turkey, in Caramania, on a lake; 6 miles E. of Beisheuri.

SIDIALIEL, a town of Nubia; 55 miles N. of Sennaar.

SIDIBISCHIR, a town of Africa, in the country of Fezzan; 16 miles E. of Mourzouk.

SIDIN, or VATISA, a river of Asiatic Turkey, which runs into the Black sea, at Vatisa.

SIDLA, SIDLAW, or *Sudlaw Hills*, a range of mountains in the counties of Perth and Angus, Scotland, which form the southern boundary of the great valley of Strathmore, whence they derive their name; Sudlaws signifying, in Erse, the south hills. This ridge commences on the west, in the vicinity of the town of Perth, and extends in a north-eastern direction to Redhead, a promontory on the coast of the German ocean, between Aberbrothwick and Montrose. The mountains which compose it vary considerably in elevation; some of them not exceeding 800 feet in height above the level of the sea, while others are upwards of 1400 feet high. The following are the heights of several of the principal of them, as ascertained by barometrical measurement: Sidlaw hill, 1406 feet; Kingseat, 1238; Kinpurnie hill, noted for an ancient tower on its summit, 1151; and Dunfinnan hill, 1024½. The last mentioned hill is remarkable for being that on which the usurper and tyrant, Macbeth, built a castle, with a view to secure his life against any attempt which might be made to murder him. Sinclair's Statistical Account of Scotland, vol. i. 1791.

SIDMOUTH, a market-town in the hundred of East Budleigh, and county of Devon, England, is seated in a valley on the banks of the river Sid, between high hills, at the distance of 14½ miles S.E. of Exeter, and 158 miles S.W. of London. Sidmouth was formerly a sea-port of some consequence; but the harbour has been so clogged with sand and pebbles, that pleasure-boats and fishing smacks are the only vessels which can now approach the shore. Of late years the buildings and population have increased, in consequence of the number of persons who frequent the place in the summer, for the purposes of bathing and recreation. Good accommodations have consequently been provided, and a ball-room, billiard-room, and tea-room, erected for the convenience of the visitors. According to the population report in the year 1811, the number of houses in the parish was 349, inhabited by 1688 persons. A weekly market is held on Saturdays, and two fairs annually. Near the beach is an ancient stone building, with very thick walls firmly cemented, traditionally said to have been a chapel of ease, when Otterton was the mother-church; and in a path leading from Sidmouth to Otterton, called Go-Church, is an ancient stone cross. At Sidmouth was formerly an alien priory, a cell to Mountborrow in Normandy, or rather to St. Michael in Per culo Maris; for to this last mentioned monastery the manor was given by king William the Conqueror. It was sometimes reckoned

as a part of Otterton priory, and, with that, after the dissolution of the foreign houses, was given to Sion abbey; and at the time of the surrender, devolved to the crown. The scenery on this coast, between Sidmouth and Seaton, is grand and romantic; presenting a succession of lofty cliffs, sloping ridges, and narrow vallies. In some places the cliffs are composed of sand, tinged by a red oxyd of iron, and is partly calcareous. On the edge of a hill, north-west of Sidmouth, is an ancient encampment, called Woodbury castle, which is of an irregular form, with deep ditches: at some places the foss is double. Observations on the Western Counties, by George Maton, M.D. 2 vols. 8vo. The History of Devonshire, by the Rev. Richard Polwhele, 3 vols. fol. 1797. The Chorographical Description, or Survey of the County of Devon, by Tristram Risdon, 8vo. 1714, 2d edit. 1811. Beauties of England and Wales, vol. iv. 1803, by J. Britton and E. W. Brayley.

SIDNA-BINES, a town of Fez, near the sea-coast.

SIDNEY, PHILIP, in *Biography*. See SYDNEY.

SIDNEY, ALGERNON. See SYDNEY.

SIDNEY, in *Geography*, a town of the island of Cape Breton; 20 miles N. of Louisburg.—Also, a town of New York, on the Susquehanna; 50 miles W. of Hudson.—Also, a post-town of the province of Maine, on the Kennebeck; 30 miles N.E. of Portland, situated in the county of Kennebeck, and containing 1558 inhabitants.

SIDNEY Cove. See SYDNEY Cove.

SIDODONA, in *Ancient Geography*, a barren place on the coast of Carmania, in the Persian gulf, where Nearchus is said to have refreshed himself, in his voyage from the isle of Oaracta to that of Cara, according to his journal of the navigation.

SIDOLOUCUM, or SIDOLEUCUM, a town of Gallia Lyonnensis, on the route from Lugdunum to Gessoriacum, between Augustodunum and Abellone, according to the Itinerary of Antonine.

SIDON, a town of Phœnicia, 30 miles from Berytus, according to the Itinerary of Antonine. This town was for a long time the metropolis of Phœnicia, till Tyre became more powerful, and contested with it this dignity. Justin says, that the Phœnicians, being obliged to abandon their country on account of an earthquake, established themselves in the vicinity of the lake of Asfyria, which they afterwards deserted, and established themselves on the neighbouring coast of the sea, where they built the town, which they called Sidon. Moses informs us that this town had been built by Sidon, the eldest son of Canaan, the father and founder of the Phœnicians. Joshua (ch. ii. v. 8) says, that the town of Sidon was rich and powerful when the Israelites took possession of the land of Canaan. St. Jerom says, that it fell to the lot of the tribe of Asher. In the year 1015, Sidon was dependent on Tyre, for Solomon induced Hiram, king of Tyre, to give orders to the Sidonians to procure from Libanus the wood which he wanted for the temple at Jerusalem, which he proposed to build. The Sidonians shook off the yoke of the Tyrians 720 years B.C. and surrendered themselves to Salmanazar, when this prince entered into Phœnicia. Josephus (Antiq.) relates, that about 150 years afterwards, Apries, king of Egypt, invaded Phœnicia with powerful armies, took Sidon by force, which event was followed by the submission of all the other towns of Phœnicia to the conqueror. Cyrus conquered this city, but the Sidonians obtained permission of the Persians to have their own kings; and they took part in all the expeditions of their new masters, according to Herodotus (l. iii.); and in the war of Xerxes against the Greeks, the king of Sidon, according to Diodorus Siculus (l. xiv.) commanded

commanded a fleet of forty-eight ships, which very much contributed to the victory which that prince obtained over the Lacedæmonians. The city of Sidon was ruined in the year 351 B.C. under the reign of Ochus, king of Persia. When the inhabitants saw the enemy in the city, they shut themselves up in their houses, with their wives and children, and were there massacred by a conflagration. Diodorus Siculus (l. xvi.) says, that the Sidonians, who were absent during this massacre, and thus escaped destruction, returned thither and rebuilt it, after Ochus had withdrawn to Persia. Arrian (*De Exped. Alex.*) says, that the Sidonians offered to submit to Alexander, when that prince entered into Phœnicia after the battle of Issus, 333 years B.C. This prince charged Hephæstion to appoint a king for this city; accordingly this officer raised to the throne of Sidon the host with whom he had lodged; but this person declined the charge, and procured the crown for a person of the royal family, called by Diodorus, Ballonymus. After the death of Alexander, Sidon was transferred to the kings of Egypt, and afterwards to those of Syria, until at length it fell under the power of the Romans. This city, according to Strabo, suffered the effects of an earthquake, which demolished half the city. See SAIDE.

SIDONA. See SIDENA.

SIDONEY, in *Geography*, a town of Hindoostan, in Oude; 42 miles W. of Kairabad.

SIDONIUS, CAIUS, SOLLIUS APOLLINARIS, in *Biography*, was born at Lyons in or about the year 430, of a distinguished family, his father and grand-father having exercised the office of pretorian-prefect in Gaul. He was liberally educated, and obtained great reputation for his literary talents, and especially his skill in the poetical art. Coming to the capital he was raised to the highest offices by several successive emperors. He married Papianilla, daughter of the emperor Avitus, whose accession he celebrated by a long panegyric in verse, which was rewarded by a brass statue of him placed in the portico of Trajan. On the deposition of that prince, he was made a prisoner at Lyons by the emperor Majorian; whose favour he afterwards obtained by a new panegyric. He was now employed by Majorian to negotiate a treaty with Theodoric, king of the Visigoths, of whose person and manners he has left us a curious description. For this service he was rewarded with the title of count. Under Severus Ricimer he defended with the most complete success Auvergne against the incursions of the barbarians. On the accession of Anthemius he was ready with another panegyric, and was in this required by the government of Rome, and the dignity of patrician was conferred upon him. In the year 472 he renounced all his secular employments, and became a bishop. He is said to have conducted himself with singular piety in his new office, to have been exemplary for charity, and all the episcopal virtues, and to have fed 4000 Burgundians, when under the pressure of famine. He was a great sufferer at the siege of Clermont, and was forced to fly at its surrender, but was very soon restored to his see. He afterwards underwent some trouble from two factious priests, who contested with him the government of the church, and also from some who were deemed by him as heretics; and to this has been ascribed his death, in 487, which has been called a martyrdom. Of the writings of Sidonius, there are extant twenty-four pieces in verse, marked with the debased character of the age, and nine books of Epistles, containing much curious information relative to the learning and history of his times. The best editions of his works are those by Savaron in 1609, and by Sirmond in 1652. Moreri. Gibbon, vol. vi.

VOL. XXXII.

SIDOWLY, in *Geography*, a town of Hindoostan, in Bahar; 10 miles E. of Saferam.

SIDRA, a town of Hindoostan, in Bahar; 18 miles N.W. of Palamow.

SIDRA, *Gulf of*, a large bay of the Mediterranean, on the coast of Tripoli, anciently called "Syrtis," extending from N. lat. 30° 30' to 32° 30', and E. long. 15° 30' to 19° 30'.

SIDRONA, in *Ancient Geography*, a town of Illyria, in the interior of Liburnia. Ptol.

SIDUS, a small borough of the territory of Corinth, E. of Schænus, which served as a port to Megara. Steph. Byz.—Also, a small borough of Asia Minor, in Ionia, in the vicinity of the town of Clazomene.—Also, another in the vicinity of the Erythræan sea.—Also, a place of Asia Minor, in Pamphylia. Steph. Byz.

SIDUS, *Georgium*, in *Astronomy*. See GEORGIAN Planet.

SIDUSA, in *Ancient Geography*, an island of Asia Minor, upon the coast of Ionia. Pliny.

SIEBELN, or SIEBENLEHN, in *Geography*, a town of Saxony, in the circle of Erzgebirg; 4 miles N. of Freyberg.

SIEBENKEES, JOHN PHILIP, in *Biography*, professor of philosophy and the Oriental languages in the university of Altdorf, and member of the Society of Volfci, at Velletri, was born in 1759 at Nurnberg, where his father was organist to one of the churches. Being intended for the church, he was initiated in the Latin and Greek languages under very able masters, and he applied also with great diligence to the Hebrew and Chaldee. In the year 1778 he repaired to the university of Altdorf, where he attended lectures on the holy scriptures, and where, in conjunction with some of the other students, he established a private literary society, the first-fruit of which was a dissertation on the religion of the ancient Germans, and other Northern people. This piece was published in 1781, and it was so highly esteemed by Ernesti, that he added it to his translation of Tacitus "De Moribus Germanorum," which was printed in 1791. He now became the tutor to some young people, and not only performed the duties attached to the office for six years with high reputation, but was able by diligence and assiduity to apply himself, at the same time, to researches in the literature, history, and arts of the ancients. He collected materials to compose memoirs of the life of Bianca Capello de Medici, grand duchess of Tuscany, which was published in one volume octavo at Gotha, in the year 1789. But the chief part of his attention was directed to the MS. treasures contained in the library of St. Mark, from which so many of the classical authors have been printed and improved. His researches here were much facilitated by Morelli, the librarian, who assisted him greatly in the art of decyphering and reading manuscripts, a business to which he himself had been unaccustomed. Here he examined with great attention the valuable manuscripts of Strabo; and studied with the utmost care the two celebrated manuscripts of the Iliad, of which, before the appearance of Valloison's edition, he gave a circumstantial account in the German work entitled "Bibliothek der Alten Literatur und Kunst." In the same work he published an extract from the Christomathia of Proclus; collated some MSS. of Heliodorus; and made selections from the unprinted scholia on Plato and other authors. With the same eagerness he examined and studied the remains of ancient art preserved in different collections at Venice. In 1788 he quitted Venice, and made a tour through many parts of Italy, and at Rome he remained fifteen months, entirely occupied in surveying the works of art, or in studying the manuscripts in different

libraries; and here he was much indebted to Reggio, the learned librarian of the Vatican, who allowed him the use of all those highly valued manuscripts, the greater part of which has been, since that, carried to Paris by the French. From these, Siebenkees made copious extracts for the improvement of Strabo and other ancient authors; and here he transcribed the Vatican MS. of the characters of Theophrastus, which is reckoned the completest and most perfect in existence. He collected likewise from this library a large mass of critical matter for the illustration of the classics, in extracts, fragments, and observations. Cardinal Borgia interested himself very much in favour of Siebenkees, and allowed him the free use of his museum at Velletri, where he wrote an explanation of a "Tessera Hospitalis," preserved in it, which was published with the following title: "Expositio Tabulæ Hospitalis ex ære antiquissimo in Museo Borgiano Velitris asservatæ." For this work, which was considered as extremely ingenious, he was elected a member of the learned society of Velletri. On his return to his native country, he visited the most celebrated libraries at Augsburg and Memingen, as well as in various monasteries in Swabia, and formed an acquaintance with many of the German literati. In the year 1790 he returned to Nurnberg, and in the following year he was appointed extraordinary professor of philosophy and of the Oriental languages at Altdorf; after this he was made regular professor of philosophy and history. Between the years 1791 and 1796, besides giving academic lectures on the Oriental as well as the Greek and Latin languages, on mythology, archæology, geography, universal history, the history of literature and of the German empire, he found leisure to publish the following works: "An Essay towards a History of the Inquisition in the Venetian States;" "A Plan for prosecuting the Study of Roman Statistics, for the Use of his Lectures;" "On the Temple and Statues of Jupiter at Olympia," an antiquarian essay. But his most important undertaking was his edition of Strabo, amended and corrected from various readings, and an improved translation, with the following title; "Strabonis Rerum Geographicarum Libri XVII. Græca ad Opt. Codd. MSS. recensuit var. lect. ad notationibusque illustravit Xylandri Verisionem emendavit I. P. Siebenkees." He contributed to many periodical works, such as the "Journal des Luxus," in which he published a picture of Venice; Harles' edition of "Fabricii Bibliotheca Græca," &c. He died in 1796. He was not distinguished by any uncommon strength of genius; but extraordinary diligence, and a most ardent attachment to literary pursuits, enabled him to acquire a very extensive knowledge of languages and literature in general. He was an excellent draughtsman, and this talent was of great assistance to him in his archæological researches in Italy. His writing, in his own language, was exceedingly elegant, but his latinity is neither pure nor correct. His service to literature would have been more important had he lived to finish his Strabo, a great part of the second volume of which was left unprinted at the time of his death. Some other works, on which he had been employed, were also left incomplete, viz. an edition of Theophrastus, from a MS. copy in the Vatican, and his valuable "Anecdota Græca," selected from the best MSS. in the Italian libraries. Both these works were completed after his death, and published at Nurnberg in 1798. Gen. Biog.

SIEBER, in *Geography*, a river of Germany, which runs into the Oder, 5 miles S. of Osterode.

SIECHAM-HOTUN, a town of Corea, in the sea of Japan. N. lat. $41^{\circ} 24'$. E. long. $127^{\circ} 24'$.

SIEDABAD, a town of Hindoostan, in Benares, on the Ganges; 15 miles N.E. of Benares.

SIEDE, a small river of Germany, which runs into the Wefer, 2 miles S. of Hoya.

SIEDENBERG, a town of Germany, in the county of Hoya; 9 miles S.S.W. of Hoya.

SIEG, a river of Germany, which rises in the east part of Nassau-Siegen, passes by Siegen, Blanckenberg, Siegburg, &c. and runs into the Rhine, two miles below Bonn.

SIEGBERG, a town of the duchy of Berg; 14 miles S.E. of Cologne. N. lat. $50^{\circ} 58'$. E. long. $7^{\circ} 18'$.

SIEGBERG. See SYBERG.

SIEGE, in *War*, the encampment of an army around a place, with design to take it, either in the way of distress and famine, by making lines all around it, to prevent any relief from without; or by main force, as by digging trenches, and making formal attacks.

The word is French, and signifies, literally, *feat*; alluding to the army's taking its feat before a town, till the reduction of the place.

The most celebrated sieges of antiquity are those of Troy, Tyre, Alexandria, and Numantium; and, among the moderns, those of Ostend, Candia, Grave, Bergen-op-zoom, Gibraltar, &c. See LINE, in *Fortification*.

SIEGE, *To raise a*, is to give over the attack of a place, quit the works thrown up against it, and the posts formed about it.

SIEGE, *To turn a*, into a blockade, see BLOCKADE.

SIEGE-Pieces, in *Coinage*, a division of modern coins, consisting of those that have been issued upon urgent necessity, during a siege, by any city or town. Patin has published a remarkable one of thick paper or parchment, struck at Leyden in 1574, when that place was besieged by the Spaniards. It has a lion rampant, PUGNO PRO PATRIA; and on the reverse this inscription, LUGDUNUM BATAVORUM. Various siege-pieces of gold and silver were issued in the reign of Charles I.; some of the latter being so large as to be of 20s. value.

SIEGEN, in *Geography*, a town of Germany, which gives name to a branch of the house of Nassau, in the vicinity of which are some considerable iron-mines and forges; 37 miles E. of Bonn. N. lat. $50^{\circ} 48'$. E. long. $8^{\circ} 8'$.

SIEGENBURG, a town of Bavaria, on the Ambs; 20 miles E. of Ingolstadt.

SIEGES, LES, a town of France, in the department of the Yonne; 24 miles W.S.W. of Troyes.

SIEGSTADT, a town of Norway, in the province of Aggerhuus; 58 miles N. of Christiana.

SIELE, a town of Lithuania, in the palatinate of Brzesc; 56 miles N.E. of Brzesc.

SIELUB, a town of Lithuania; 8 miles N. of Novogrodek.

SIEMIECZOW, a town of Lithuania; 15 miles W. of Sluck.

SIENAGE, a town of South America, in the province of Tucuman; 130 miles N. of St. Miguel de Tucuman.

SIENE', in *Ancient Geography*, a town of Egypt, situated, according to Pliny, in a peninsula, on the western bank of the Nile, in which was a Roman garrison. See SYENE.

SIENITE, *Granitelle* of Saussure, in *Geology*, a rock nearly resembling granite, but composed of felspar and hornblende, and occasionally containing quartz and mica. The name is derived from the city of Sienna, in Upper Egypt, where immense quantities of this stone were worked by the Romans, and large blocks and columns were brought from thence to Rome. The Egyptian sienite is in fact a granite,

granite, intermixed with a small quantity of hornblende. Some sienites are coarsely granular, containing large distinct crystals of red felspar; in other sienites the crystals are very minute, and the hornblende greatly predominates: in the latter case, sienite passes into the rock which the Germans call *grun-ftein*, or green-stone. When the sienite is finely granular, but contains large crystals of felspar imbedded, it is then denominated sienite porphyry. This rock frequently occurs in large continuous masses, lying over granite and slate rocks. It is sometimes divided into distinct layers, which, by the German geologists, have been called *strata*; in other instances, it assumes the prismatic or columnar form. Some mineralogists class all those granites with sienite, which contain a portion of hornblende; but this distinction appears useless, for the same mineralogists admit that hornblende is frequently a constituent part of gneiss or slaty granite.

In the infancy of science, substances which are essentially distinct, are apt to be confounded together, if they possess certain points of resemblance; and in a somewhat more advanced state of information, substances, that are essentially the same, are often separated, by artificial classifications, into distinct orders or species, by those who are accustomed to inspect the cabinets of collectors, and overlook the great features of nature. Thus much useless discussion has arisen with respect to certain rocks, whether they were to be classed with granite or sienite, &c. The operations of nature, in the composition of the great rock formations, are not to be limited by the definitions of the mineralogist. Almost all rocks, with the exception of the calcareous, pass by such insensible gradations into each other, that the most experienced eye would find it difficult to class them, from the inspection of detached specimens. Nor will this appear surprising, when we consider that *silice* generally composes half or more of the substance of all rocks not calcareous, whether simple or compound; and even the distinct concretions in compound rocks generally contain about the same proportion of *silice*, except quartz, which is almost entirely formed of it. Even in common clay, though the properties of *silice* are concealed by a portion of alumine, yet it is still the predominating part of the mass. Now whether rocks were consolidated from a solution, or from a state of igneous fusion, the *silice*, or principal ingredient, as it became variously intermixed with the other earths, would, on consolidation, pass into a vast variety of forms. Where the solution or fusion continued for a longer time undisturbed, the laws of chemical affinity would have freer action, and dispose the different elementary parts to assume those distinct crystalline forms peculiar to certain combinations and proportions of the earths. Where, from change of temperature, or other causes, the play of chemical affinity was interrupted, the mass would become confusedly crystalline, and lose all appearance of crystallization; and between these extremes there might be every possible variety of gradation, such as we now find to exist.

Hornblende appears to be the substance which connects granite with rocks that have a very different external appearance. When hornblende exists in small quantities in granite, it does not change the character of the rock, where the three essential substances, quartz, felspar, and mica, form the prevailing part of the mass; for chlorite, steatite, and other minerals, are intermixed in small quantities in the granite of the higher Alps. When the quantity of hornblende is increased, and that of the mica and quartz diminished, the rock is properly what mineralogists denominate sienite. When the hornblende and other minerals, except felspar, are so intimately mixed as to form one

homogeneous paste, in which the crystals of felspar are imbedded, it then constitutes a porphyry. When the hornblende greatly predominates, and the felspar is in very small crystals, it forms green-stone. When the crystals are no longer discernible, it forms rocks to which the name of trap have been given. (See TRAP.) Green-stone may be considered as a crystalline variety, and basalt as an earthy variety, of trap. Thus by an intermixture of hornblende, we have an insensible gradation from highly crystalline granite and sienite to a compact earthy rock, in the internal structure of which scarcely any trace of crystallization can be seen.

Sienite is found in Cornwall, and the western side of Wales, and at Chamwood forest in Leicestershire: from the latter place it is sent to London, and to Nottingham and Leicester, cut into blocks for paving-stones. A beautiful green and red sienite forms one of the hills called Mark-field, which is described in Mr. Bakewell's *Geology*, as covered on its summit with pyramidal blocks of the same stone, which he conceives might be employed for durable ornamental architecture. Sienite occurs in many of the mountainous parts of Scotland, but is not, we believe, a metalliferous rock in any part of Great Britain; nor has it, we believe, been applied to any other purpose than for paving-stones. Many of the ancient statues and columns in Egypt are formed of this stone; and it has been before observed, that it was brought in great quantities from that country by the Romans, on account of the vast columns, &c. which could be formed from single blocks. As a proof of its durability, it is stated by travellers that columns which the Romans left unfinished in the quarries of Sienna, nearly two thousand years since, preserve to the present day the impression of the tools as sharp and distinct as if they had been recently worked.

SIEN-KU, in *Geography*, a town of China, of the third rank, in Tche-kiang; 18 miles W.S.W. of Tai-tcheon.

SIENNA, or SIENA, a city of Italy, and capital of a district, in Etruria. This district, called Siennefe, or Territorio di Sienna, was once a free republic, conquered by the emperor Charles V. in the year 1554; whose son, Philip II. king of Spain, ceded all parts, except the *Stato de gli Præsidii*, to Cosmo I. duke of Florence. The city is pleasantly built on three hills, in a healthy situation. The houses are of brick, and the streets paved with the same. It is nearly five miles in circumference, but not peopled in proportion to its size; the inhabitants scarcely exceeding 17,000. It is the see of an archbishop, and the cathedral is a fine Gothic building, coated with white and black marble within and without. The great portal was begun in the year 1284, after the designs of Giovanni da Pisa, and finished in 1333, by Augutino and Agnolo, Siennefe architects. The front is prodigiously loaded with ornaments. All the work of the inside is most highly finished, as the carving in wood of the choir; the sculpture in marble of the pulpit; and especially the historical engraving of the pavement, representing in chiaro-scuro the most remarkable stories of the Old and New Testament. From an aperture in the choir pavement may be seen St. John's church, which lies directly underneath. Its entrance is without, on the hill; and thus one church may be said to stand on another. Near the cathedral is the archbishop's palace, and opposite to it a large and well-endowed hospital, founded by a shoe-maker. Here are also many other churches and convents. The church of the Dominicans is remarkable for an ancient picture of wood, representing the Virgin with the infant Jesus in her arms, by Guido Sanese: it is dated 1221, and is in the Venturini chapel: though so

ancient, it is in good preservation. The university was founded by Charles V. The German students enjoy particular privileges, which they derive from the same emperor. In the 15th century the academy of the Intronati was here founded. This city still retains some shadow of its former republican liberty, which may appear from the manner of electing its council, which consists of nine persons, styled *Excellenzi*; but whose power the great duke very much curtailed. The castle, built at one end of the city, in order to curb the inhabitants, is of no great strength. Near it is the university's academy for martial exercises. Many nobility reside here, who have a casino or assembly of both sexes; and it is generally allowed that the Italian language is in no part of Italy spoken with greater purity; 54 miles S. of Bologna. N. lat. 21°. E. long. 11° 16'.

SIENNE, a river of France, which runs into the sea, near Havre.

SIENNOI, a town of Russia, in the government of Mogilev; 60 miles N.N.W. of Mogilev. N. lat. 54° 30'. E. long. 29° 44'.

SIEN-TCHING, a town of Corea; 23 miles N.W. of Long-kouang.

SIEN-YEOU, a town of China, of the third rank, in Fo-kien; 22 miles N. of Siuen-tcheou.

SIEOU, a city of China, of the second rank, in Kiangnan; 381 miles S. of Peking. N. lat. 33° 45'. E. long. 117° 32'.

SIEOU-GIN, a town of China, of the third rank, in Quang-fi; 15 miles N.W. of Yong-ngan.

SIEOU-OU, a town of China, of the third rank, in Ho-nan; 36 miles S.W. of Vue-kiun.

SIEOU-YUEN-HOTUN, a town of Chinese Tartary; 330 miles E. of Peking. N. lat. 40° 18'. E. long. 122° 51'.

SIEPERNOI-PESOK, a small sandy island of Russia, in the Frozen ocean. N. lat. 71° 30'. E. long. 106° 14'.

SIER, a river of France, which rises about six miles S.E. of Thonnes, and runs into the Rhône, near Seissel.

SIERAGE, a town of Hindoostan; 32 miles N.W. of Benares.

SIERCK, a town of France, in the department of the Moselle. In 1792, this town was taken by the duke of Brunswick; 9 miles N.N.E. of Thionville.

SIERMAH, a town of Bengal; 24 miles S. of Palamow.

SIERNDORFF, a town of Austria; 7 miles N.W. of Korn-Neuburg.

SIERNING, a town of Austria; 12 miles S.W. of Ebenfurth.

SIERO, a town of Spain, in Asturia; 9 miles N.E. of Oviedo.

SIEROCK, a town of the duchy of Warsaw; 15 miles N. of Warsaw.

SIERRA, the eastern part of New Castile, so called from its mountains. The word Sierra is a general name for mountain in Spain, and those distinctive appellations are often given from the neighbouring towns.

SIERRA d'*Adriana*, mountains of Spain, in Guipuscoa, which took their name from the hermit Adrian. The road leading over it to Alaba and Old Castile is very difficult to travellers. At the very beginning of it is a dark space, between 40 and 50 paces in length, cut through a rock; after which we ascend up a hill, which is reckoned the highest among the Pyrenées. These mountains are but little inhabited, a few shepherds' huts only being to be seen; 18 miles S. of Tolosa.

SIERRA de *Bejar*, a mountain of Spain, in the province of Leon; 20 miles N.N.E. of Plasencia.

SIERRA *Cava*, a small rocky island, near the east coast of Sardinia. N. lat. 39° 46'. E. long. 10°.

SIERRA del *Cid*, a mountain of Spain, in Valencia; 14 miles N.W. of Alicant.

SIERRA de *Cobre*, a mountain of the island of Cuba; 15 miles W. of St. Jago.

SIERRA de *Guadarama*, a mountain of Spain, in the fourth part of Old Castile; 15 miles S. of Segovia.

SIERRA di *Gador*, a mountain of Spain, in the kingdom of Grenada; composed of marble, of which they make excellent lime; 12 miles S. of Almeria.

SIERRA de *Gredor*, a mountain of Spain, in the province of Leon; 25 miles N.W. of Plasencia.

SIERRA *Jalama*, a mountain of Spain, in Estremadura; 20 miles N.W. of Coria.

SIERRA *Leona*, a country of Africa, in Upper Guinea; so called because it is mountainous, and the mountains abound in lions. It is composed of several states or kingdoms, and is well watered by a river of the same name, at the mouth of which an association of English gentlemen established a settlement, on land purchased of the prince of the country. This company was incorporated by act of parliament, in the year 1791. A considerable number of whites and free negroes were conveyed thither from Nova Scotia, besides many who went from England. At first the new settlers seem to have suffered from the want of proper habitations during the rainy season, but subsequent accounts were more favourable. In the month of December 1793, the natives continued perfectly friendly; the neighbouring chiefs shewed every desire of being connected with the company: some had sent their children to be educated at Sierra Leona, and many others proposed to send them in the ensuing dry season. The rainy season had passed over without any considerable mortality; and the Nova Scotia colonists had maintained their health, and appeared to have become well inured to the climate. The trade was much more brisk; the cultivation was advancing, both in the colony and parts adjacent; and there appears to have been no difficulty in procuring the native labourers. The rice, cotton, and other articles in the company's plantation, had thrived exceedingly, the sugar-cane excepted, which had been hurt by the white ants. The school of the company contained between 300 and 400 children, chiefly Nova Scotians, who appear to have made full as much improvement as is common in European schools, under similar circumstances. The colony had gradually improved in order, and appeared to be advancing in every respect; but neither these appearances, nor several parliamentary aids, could support it sufficiently against new difficulties which continually occurred; and the company was dissolved in 1807. Sierra Leona river abounds in fish, but is much infested with alligators. The country adjacent produces abundance of millet and rice; and the woods are filled with parrots of various kinds, and other beautiful birds; serpents are found, some of a very large size; and numerous wild beasts, such as lions, tigers, elephants, wild boars, and monkeys.

The benevolent and laudable exertions of the African Institution, established since the abolition of the slave-trade, have very much contributed to the prosperity of the colony of Sierra Leona. The climate is much better for European constitutions than that of almost any other part of the coast. There are now 400 houses within the walls of Freetown, containing 1917 inhabitants, beside about 2500 Negroes, freed by sentences of the admiralty-court, and residing there under the protection of the government. There is a considerable

considerable number of European forts on the coast, apparently very useless, except for slave-trading purposes. From Apollonia to Acra, a distance of only 64 leagues, there are no fewer than 27; and the expence of the British forts is about 25,000*l.* annually. Government, it is said, has it in contemplation to dismantle all those, except one or two, which will be put in a respectable state of defence. See SLAVE-TRADE.

Amongst the labourers at Sierra Leona there are above 800 persons of the tribe of Kroomen; and they are to be found at every factory and town along the coast, for the space of 350 miles. They are employed as factors or intermediate merchants, boatmen, and sailors; and while the slave-trade was carried on upon this coast, they had their share of its occupation. After the age of 40, they return and settle at home. Their country, or Kroo country, extends along the Grain Coast, between Mount and Cape Palmas, from 4° 54' to 5° 7' N. lat. The chief town, Settra Kroo, is in W. long. 7° 48'. This district, though small, is populous; and the natives are of a migratory disposition. Their country produces grain, particularly fine rice, pepper, and cattle; but their staple article is their own labour, with which they purchase goods, and return to their home with the produce. Wars are rare among these people, and they never fell one another, nor kill their captives; nor do they punish any offence by slavery, though witchcraft is a capital crime, and the only one that is invariably so among them. While the slave-trade lasted, they used to kidnap the "Bushmen," or natives of the interior, and sell them.

These Kroomen are indolent, but when task-work is assigned them, they exert themselves very much; as the reward, in this case, is proportioned to their labour. In their expenditure they are rigid economists, the only luxury which they allow themselves being tobacco. Their whole subsistence is only from 1½ lb. to 1¾ lb. of rice, clean and fit for use, *per* day; and of this they will sell one half, when rice is dear. Though they are fond of rum, they never buy it; and some of them will not drink it, when offered to them. Their clothing does not cost them 10*s.* a year. The residue of their grain they lay out in goods; and in 18 months, or two years, the Krooman returns home with his wealth. This he distributes liberally; and what remains he gives to his father to buy him a wife. Having had a wife, after a few months of ease and indulgence, he sets off again for Sierra Leona. When his coffers are replenished, he returns home, and disposes of his riches as before; reserving a part, which he gives to his father to buy him another wife. Thus he proceeds for twelve years or more, increasing the number of his wives, and establishing a great character among his countrymen.

The Kroomen are peculiarly distinguished by their extreme love of their own country, which they think superior to all others. All their exertions are to obtain a sufficiency, that they may return and live there. They have not the use of letters, and will not permit their children to learn; and as they live by daily labour, which is paid for in European goods, they have no occasion for manufactures of their own. They have few opportunities of displaying peculiar talents; however, they make their own canoes, several of their implements of agriculture, and some trifling musical instruments.

SIERRA Leona, a river of Africa, called also "Ritomba," and "Tagrin," about eight miles broad at its mouth, which runs into the Atlantic ocean, N. lat. 8° 20'. W. long. 12° 30'.

SIERRA *Morena*, a mountain, or rather a chain of mountains, of Spain, between the provinces of Cordova and Jaen to the south, and Estremadura and La Mancha to the north. A few years ago, this district was the dread of travellers. M. le Maur, a Frenchman, who for a long time has been one of the corps of engineers of Spain, was chosen in the year 1779, by the count de Florida Blanca, to render practicable a road the most frequented of any in the kingdom; and he has made it one of the finest in Europe. Several new settlements have been formed, and new towns founded in this barbarous district.

SIERRA *Madre*, a lofty chain of mountains of New Mexico, crossing the province of Cinaloa.

SIERRA *de Motin*, a headland on the coast of Mexico. N. lat. 19° 50'. W. long. 104° 36'.

SIERRA *Nevada*, mountains of Spain; 20 miles E. of Grenada.

SIERRA *Nevada*, or *Iztaccibnatl*, a volcanic mountain of Mexico, whose summit is always covered with snow; 30 miles S.E. of Mexico.

SIERRA *de Nuestra Senora*, a range of mountains in South America, forming the western boundary of the province of Tucuman.

SIERRA *de St. Mamed*, a mountain of Spain, in Estremadura; 25 miles N. of Badajoz.

SIERRA *de St. Pedro*, a mountain of Spain, in Estremadura; 36 miles S.W. of Truxillo.

SIERRA *de Torquino*, a mountain of the island of Cuba; 25 miles S. of Bayamo.

SIERRA *Vermejo*, a range of hills in Spain, which run westerly towards Malaga, and afford a singular curiosity: for though they run parallel, and so close that their bases join, yet one is red and the other is white; snow will not remain on the highest, whilst it constantly covers the other. The white hills produce the cork-tree, and the Encina oak; the red has no oak, but is covered with firs. The white has iron-ore in little lumps; the red has several ores, but no iron. The waters of the white hills are martial and vitriolic; those of the red sulphureous, alkaline, and with a strong smell like those of Cotterets, in France.

SIERSBERG, a town of France, in the department of the Moselle, near the river Nied; 4 miles N.N.W. of Sar Louis.

SIERSHAGEN, a town of the duchy of Holstein; 2 miles N.W. of Neustadt.

SIETAMO, a town of Spain, in Aragon; 5 miles E. of Huesca.

SIETTREE, a town of Bengal; 4 miles S. of Burwa.

SIEVE, a river of Etruria, which runs into the Arno.

SIEVE, or *Searce*, an instrument serving to separate the fine from the coarse parts of powders, liquors, and the like; or to cleanse pulse from dust, light grains, &c.

It is made of a rim of wood, the circle or space of which is filled with a plexus of silk, tiffany, hair, linen, wire, or even thin slices of wood.

The sieves which have large holes, are sometimes also called *riddles*: such is the coal or lime-sieve, the garden-sieve, &c.

When drugs apt to evaporate are to be passed through the sieve, it is usual to have it covered with a lid.

SIEVERNİYAGOI, or *Ruthem Mountains*, in Geography, mountains of Russia, extending between the Baltic and the White sea.

SIEVERNOIPESOK, a small sandy island in the Frozen ocean, near the continent of Russia. N. lat. 76° 54'. E. long. 105° 14'.

SIEVERO-VOSTOCHNOI, a cape on the north coast of

of Ruffia, called *Cape Taimura* by captain King. N. lat. 78°. E. long. 101° 14'.

SIEVERO-ZAPADNOI, a cape on the north coast of Ruffia. N. lat. 77°. E. long. 94° 14'.

SIEUGUR, a town of Hindooftan, in Malwa; 9 miles S. of Tandla.

SIEVI, a town of Sweden, in the government of Ulea; 45 miles S. of Braheftad.

SIEUR, a title of honour, or quality among the French; chiefly used among the lawyers, and in public acts, and other writings of that kind.

The title *sieur* is also given by a superior to an inferior, in his letters and other private writings.

In this sense, authors sometimes use it, by way of modesty, in speaking of themselves: thus, at the heads of books, we see *Traduction du sieur d'Ablancourt*; *Œuvres du sieur d'Espreaux*, &c.

SIEUR is also a term expressing seignury, or lordship: as *ecuyer* or *sieur* of such a place.

SIFACE, GIOVAN FRANCESCO, *Detto*, in *Biography*, a celebrated opera singer in the service of the court of Modena, who obtained the title of Siface from his admirable performance of the part of Syphax, in the old opera of *Mitridate*, modernized by Metastasio, and set by Porpora for Venice in 1730. Algarotti highly praises the pathetic manner in which he sung. Though it is confidently asserted, in the work of a late historian, that Siface had been in England as a singer in the chapel of king James II., yet we can trace no proof of this assertion.

In travelling from Ferrara to Modena, he miserably lost his life in a quarrel with an insolent and brutish postilion.

SI-FANS, or **TOU-FANS**, in *Geography*, subjects of the Chinese empire, who inhabit to the west of China, and the provinces of Chen-fi and Se-tchuen. Their country is only a continued ridge of mountains, inclosed by the rivers Hoang-ho on the N., Ya-long on the W., and Yang-tse-kiang on the E., between the 30th and 35th degrees of north latitude. The Si-fans are divided into two kinds of people; the one are called by the Chinese *black* Si-fans, the other *yellow*, distinctions arising from the different colours of their tents. The black are the most clownish and wretched; they live in small bodies, and are governed by petty chiefs, who all depend upon a greater.

The yellow Si-fans are subject to families, the oldest of which becomes a lama, and assumes the yellow dress. These lama-princes, who command in their respective districts, have the power of trying causes, and punishing criminals; but their government is by no means burdensome: provided certain honours are paid them, and they receive punctually the dues of the god Fo, which amount to very little, they molest none of their subjects. The greater part of the Si-fans live in tents; but some of them have houses built of earth, and even brick. Their habitations are not contiguous; they form at most but small hamlets, consisting of five or six families. They feed a great number of flocks, and are in no want of any of the necessaries of life. The principal article of their trade is rhubarb, which their country produces in great abundance. Their horses are small; but they are well-shaped, lively, and robust.

These people are of a proud and independent spirit, and acknowledge with reluctance the superiority of the Chinese government, to which they had been subjected: when they are summoned by the mandarins, they rarely appear; but the government, for political reasons, winks at this contempt, and endeavours to keep these intractable subjects under by mildness and moderation: it would, besides, be difficult

to employ rigorous means in order to reduce them to perfect obedience—their wild and frightful mountains (the tops of which are always covered with snow, even in the month of July) would afford them places of shelter, from which they could never be driven by force.

The customs of these mountaineers are totally different from those of the Chinese. It is, for example, an act of great politeness among them to present a white handkerchief of taffety or linen, when they accost any person whom they are desirous of honouring. All their religion consists in their adoration of the god Fo, to whom they have a singular attachment: their superstitious veneration extends even to his ministers, on whom they have considered it as their duty to confer supreme power, and the government of the nation.

Some of their rivers wash down gold mixed with their sands: they are acquainted with the art of applying it to use, and form it into vases and small statues, of which they often make offerings to their idol; it even appears that the use of gold is very ancient among them; for Chinese books relate, that under one of the emperors of the dynasty of Han, an officer having been sent to the Si-fans to complain of the ravages committed by some of their chiefs, they endeavoured to appease him by making him a present of a piece of gold plate, which the officer refused, telling the Si-fans, that rice served up in golden dishes was to him insipid food.

These people have lost much of their ancient splendour; for the Si-fans, who at present are confined in a wild country, where they have not a single city, enjoyed formerly an extensive dominion, and formed a powerful and formidable empire, the chiefs of which have often given great uneasiness to the emperors of China. They possessed towards the east several tracts of land, which at present make part of the provinces of Se-tchuen and Chen-fi; they even extended their conquests to China, so as to render themselves masters of several cities of the second class, of which they formed four principal governments: in the west, they seized upon all the countries which lie beyond the river Ya-long, and reach as far as the boundaries of Cachemir; but intestine divisions insensibly weakened this great monarchy, and at length brought it to ruin. The Chinese annals fix the epocha of its downfall about the year 1227: since that time, the Si-fans have retired to their native mountains, where, from being a conquering and polished people, they have again sunk into their original barbarity.

SIFEABAD, a town of Hindooftan, in the province of Sirhind; 10 miles S. of Sirhind.

SIFEED Rook, or *White River*, a river of Persia, so named from the foam occasioned by the rapidity of the current, that flows in a meandering course through Ghilan to the Caspian sea.

SIFFLET, Fr. a cat-call. According to M. Laborde, it was during the reign of Augustus that *clapping* of hands and cat-calls were introduced in the Roman theatres. *Essai sur la Musique*.

SIFTE, in *Geography*, a pretty considerable village of Egypt, between Cairo and Damietta. It has three mosques, and a church belonging to the Copts, the congregation of which consists of 300 families. See *SEDFÉ*.

SIG, in *Agriculture*, a provincial term applied to urine, or chamber-ley, as employed by the farmer.

SIG, in *Geography*, a lake of Ruffia, in the government of Olonetz, about forty miles in circumference; 40 miles W. of Povenetz.

SIGA, in *Ancient Geography*, a river of Africa, in Mauritania

ritania Cæsariensis. Ptolemy places the mouth of it between the town of Siga and the mouth of the river Asarath. —Also, a town of Africa, in Mauritania Cæsariensis. It had the title of a colony, and was situated between the port Gypsaria and the mouth of the river Siga. Ptolemy. Strabo says, that this town was destroyed by the Romans, and that the palace of Syphax was here.—Also, a royal town, situated in Africa, in Numidia, and on the western part of the river Mulucha. It was the capital of the kingdom of Syphax.

SIGAGIK, in *Geography*, a town of Asiatic Turkey, in Natolia, on the sea-coast; 14 miles S.W. of Smyrna. N. lat. 38° 18'. E. long. 16° 31'.

SIGAH-Guſt, or SIYAH-Guſt, or Black-Ear, in *Zoology*, the name of a Persian animal, of the felis or cat-kind, and no way differing from the lynx, but in that it has no spots; it has a lengthened face, and small head; its ears have the fine velvety black pencil of hairs at the top, which are the distinguishing character of the lynx; the inside and bottom of the ears are white; the nose white, the eyes small, the upper part of the body of a very pale reddish-brown, the tail darker, and about half the length of the body; the belly and breast whitish; the limbs strong, and pretty long, the hind-part of each marked with black. This animal inhabits Persia, India, and Barbary; and is used in the chase of lesser quadrupeds, and the larger sort of birds, which they artfully surprise and seize; it is said to attend upon the lion, and to feed on the remains of its prey. It is fierce when provoked. Pennant's Hist. Quadr. vol. ii. p. 283. Phil. Transf. vol. li. part ii. p. 648, &c.

SIGALA, in *Ancient Geography*, a town of India, on this side of the Ganges, according to Ptolemy, who assigns it to the Mandrales.

SIGANA, a town of Arachosia. Ptolemy.

SIGARAM, in *Geography*, a town of Hindoostan, in Golconda; 12 miles N. of Rachore.

SIGATHA, in *Ancient Geography*, a town of Libya. Strabo.

SIGE, a town of Asia Minor, in the Troade. Steph. Byz.

SIGEAN, in *Geography*, a town of France, in the department of the Aude, near which Charles Martel defeated the Saracens; 9 miles S. of Narbonne.

SIGEBERT I., in *Biography*, king of Austrasia, born about the year 535, was third son of Charles I., king of the Franks. At the death of that sovereign, in 562, his dominions were divided between his sons; and Austrasia, or the kingdom of Metz, fell to the lot of Sigebert. His territories were invaded, soon after his accession, by the Huns, whom he defeated and drove across the Elbe. During his absence, his brother Chilperic made an irruption into Austrasia, and took several places; but Sigebert returning with a victorious army, took Soissons, Chilperic's capital, and defeated Chilperic himself in battle. He was, however, induced to grant him favourable terms, and to restore the conquests made upon him. Sigebert's reputation was now so high, that he obtained for a wife the famous Brunehaut, daughter of the Spanish king of the Visigoths, with a rich portion. The dominions of his brother Caribert, at his death, were shared by the three survivors; but it was not possible for such a divided empire to continue long at peace. Chilperic had married Gulsuintha, sister of Brunehaut, who was afterwards murdered at the instigation of his mistress, Fredegonde. Brunehaut invited Sigebert, in conjunction with his brother Gontran, king of Burgundy, to revenge this crime, and they over-ran a

great part of his dominions, and forced him to purchase peace by the cession of several places. The Avars, or Huns, soon after made a second irruption into Austrasia, when Sigebert's troops, terrified at their savage appearance, refused to act, and he was obliged to purchase a peace, and supply them with provisions to return to their own country. After this, Sigebert assembling a numerous army, after making himself master of the greatest part of Chilperic's territories, invested him in Tournay, and refused to listen to terms of accommodation. When the ruin of that prince seemed to be inevitable, Fredegonde, hiring two assassins, who pretending to have some important secret to communicate to Sigebert, thrust their daggers into his body, in the midst of his army. This was in the year 575, after he had reigned 14 years, leaving behind him the character of the greatest and best of the sons of Clotaire.

SIGEBERT, SIGEBERTUS, a monk of Gemblours, in the diocese of Namur, in Brabant, who passed in his time for a man of wit, universal learning, and a good poet. In the younger part of his life he embraced the monastic state in the abbey of Gemblours, under the abbot Olbertus, who died in 1048. During his novitiate he was invited to Metz, where he studied in the school of the monastery of St. Vincent, and acquired great consideration by his learning, in which he was superior to most of the other writers who flourished at the same period. He was acquainted with the Greek and Hebrew languages, and in consequence of the progress he had made in the latter, was much esteemed by the Jews at Metz, where he resided a considerable time, and from which he was with difficulty suffered to depart, in order to return to his former monastery. His celebrity accompanied him thither: he gained many scholars, who did honour to their instructor; and he was chosen by the clergy of Liege to manage their defence in a controversy which they had with the pope, and which he conducted with great talent and moderation. He took sides in the quarrel of Gregory VII., Urban II., and Pascal II., with the emperor Henry IV.; and he wrote against these pontiffs without the least ceremony. Sigebert is author of a Chronicle, the best edition of which was published at Antwerp in 1608, in 4to. It is carelessly written, and in a vulgar style; but contains curious and well authenticated facts. And in endeavouring to ascertain to whom the system of solmification by the hexachords belongs, Sigebert in his Chronicle, under the year 1028, as well as in his account of ecclesiastical writers, says, that "he had excelled all his predecessors; as by his method children were taught to sing new melodies, with more facility than by the voice of the master, or the use of an instrument: for by only affixing six letters, or syllables, to six sounds, all that music admits of, regularly, and distinguishing these sounds by the joints of the fingers of the left hand, their distances ascending and descending through the whole diapason, are clearly presented both to the eye and the ear."

Now as Sigebert was nearly contemporary with Guido, his testimony in favour of the discoveries attributed to him have more weight than any proofs that can be adduced from such of his own writings as are generally known. The Chronicle of Sigebert begins at 181, and is continued to 1112; he died the year after.

But what entitles Sigebert to an article in our department, besides his bearing testimony to the inventions of Guido, and his musical records in several other articles of his Chronicle, is the information which he himself gives us in his life, that he had set to music the anthems and responses of St. Guibert; that is, had composed all that was necessary

fary to form an entire office to his honour. And this information is copied by Fabricius, De Script. Eccles. Arte Musica Antiphonas et responforia de sanctis.

SIGENBURG, in *Geography*. See SIEGENBURG.

SIGENSUS PORTUS, in *Ancient Geography*, a port of Africa, on the coast of Mauritania Cæsariensis, between Siga and Camarata, according to the Itinerary of Antonine.

SIGER, in *Geography*, a river of Silesia, which runs into the Oder, six miles below Benthien.

SIGESBECKIA, in *Botany*, was so named by Linnæus himself, in memory of his antagonist Dr. John George Siegesbeck, superintendant of the physic-garden at Petersburg, who raised various objections against the sexes of plants and the Linnæan system, and who has had the honour of being answered by Stillingfleet amongst others.—Linn. Gen. 436. Schreb. 571. Willd. Sp. Pl. v. 3. 2219. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 119. Pursh v. 2. 561. Juss. 187. Lamarck Illustr. t. 687. Gærtn. t. 168.—Class and order, *Syngenesia Polygamia-superflua*. Nat. Ord. *Compositæ oppositifoliæ*, Linn. *Corymbifera*, Juss.

Gen. Ch. *Outer Common Calyx* of five linear, cylindrical, widely spreading, permanent leaves, longer than the flower: *inner* somewhat five-angled, of several ovate, concave, obtuse, equal leaves. *Cor.* compound, with a half radius. *Florets* of the disk united, several, funnel-shaped, exceeding the calyx in length, with either five or three teeth; of the radius five, or not so many, all on one side of the flower, female, ligulate, broad, short, three-cleft. *Stam.* in the united florets, Filaments five or three, very short; anthers combined in a cylindrical tube. *Pist.* in the united florets, Germen oblong, incurved, the size of the calyx; style thread-shaped, the length of the stamens; stigma divided: in the females, Germen oblong, incurved, the size of the calyx; style and stigma as in the united florets. *Peric.* none, the calyx remaining unchanged. *Seeds* in the united florets solitary, oblong, bluntly quadrangular, thickened upwards, obtuse, naked; down none; in the female ones the same. *Recept.* chaffy; scales very like the scales of the calyx, concave, embracing the seeds at one side, deciduous.

Eff. Ch. Receptacle chaffy. Seed-down none. Outer common calyx of five leaves; inner spreading. Radius all on one side.

Obf. *S. flosculosa* of L'Heritier offers a singular exception in this great natural class, with regard to number, having the florets of the disk three-cleft, and triandrous.

1. *S. orientalis*. Oriental Siegesbeckia. Linn. Sp. Pl. 1269. Willd. n. 1. Ait. n. 1. (Siegesbeckia; Linn. Hort. Cliff. 412. t. 23. *S. triangularis*; Cavan. Ic. v. 3. 27. t. 253. *Cichoreo affinis*, *Lampfana finica*, *mentastri foliis*, calyce fimbriato hispido, sinice *hi-him-t'aw* dicta; Pluk. Amalth. 58. t. 380. f. 2.)—Leaves stalked, ovate, unequally toothed; somewhat angular at the base. Outer calyx twice as long as the inner.—Native of China and the East Indies; also, according to Cavanilles, of Mexico. Thouin informed the younger Linnæus that he had it from the Cape of Good Hope, and the straits of Magellan. The plant has been known for near a century in the gardens of Holland and England, and is a tender annual, flowering in July and August, but with much more singularity than beauty to recommend it. The stem is bushy, leafy, round, rough, three or four feet high. Leaves opposite, rough, two or three inches long, somewhat dilated and triangular at the base, tapering down into each footstalk; the uppermost much smaller and more oblong. Flowers numerous, terminal, stalked, brownish-yellow, chiefly conspicuous for the spreading outer leaves of their glandular viscid calyx, each three-

quarters of an inch long. We cannot agree with Willdenow in discarding Plukenet's synonym, which surely agrees better with this than with the following.

2. *S. iberica*. Georgian Siegesbeckia. Willd. n. 2. (Bidentifimilis, foliis latissimis ferratis; Buxb. Cent. 3. 29. t. 52.)—Leaves stalked, ovate, bluntly toothed; rounded at the base. Outer calyx the length of the inner.—Observed by Buxbaum about villages in Media, flowering in July. Willdenow, who had seen a dried specimen, asserts this to be a very distinct species from the former, to which Linnæus referred Buxbaum's synonym. The leaves, it seems, are neither triangular, nor cut at the base, but shortly and bluntly toothed. The outer and inner calyces, being both of an equal length, seem to us a more certain distinction.

3. *S. flosculosa*. Small-flowered Siegesbeckia. L'Herit. Stirp. 37. t. 19. Willd. n. 3. Ait. n. 2. Pursh n. 1. Ehrh. Exsicc. n. 79.—Leaves nearly sessile, ovate, toothed. Florets of the disk three-cleft, triandrous.—Native of Peru, from whence we believe its seeds were brought or sent by the unfortunate Dombey. This has the habit of the first species, but the stem is smoother. The leaves, though tapering at their base, are scarcely stalked, nor are they at all dilated, or angular. The greatest peculiarity is found, as we have already said, in the flowers, which are smaller and paler than those of *S. orientalis*, usually, though we believe not always, destitute of a radius, but singularly remarkable for the florets of the disk having only three teeth and three stamens.

For *S. occidentalis*, Linn. Sp. Pl. 1269, see PHAETHUSA and VERBESINA.

SIGET, in *Geography*, a town of Hungary, on the frontiers of Poland, near the source of the Theysse; 50 miles E. of Munkacz. See also ZIGET.

SIGEUM, in *Ancient Geography*, a town and port of Asia Minor, in the Troade, at the distance of 60 stadia from the town of Rhœteum, and 100 stadia from Tenedos. Strabo reports that this town was ruined in his time. The Mylietians built it; but soon after the Athenians expelled them, which occasioned a long war between these two people; but at length, according to Herodotus (l. v.), having submitted it to the arbitration of Periander, the son of Cypselus, this prince adjudged it to the Athenians, in the year 564 B. C. or, according to the computation of Usher, in the year 589. The Athenians kept possession of it till the time of Alexander. Under his successors it was destroyed by neighbouring people. Pliny speaks of it as of a town which had long ago subsisted: "quondam Sigæum oppido." Sigæum was re-established under the Christian emperors, and erected into a bishopric dependent upon Cyzicus. A miserable village, which has been built upon its ruins, and which presents a few vestiges of the ancient town, is called by the Turks "Yenitcher-Keui," or village of the janizaries, and "Diagur-Keui," or village of the infidels, as it is no longer occupied except by Greeks. The curious go thither to admire a block of marble, eight or nine feet long, placed by the side of the door of a church: it bears a Greek inscription, almost entirely effaced, the words of which follow one another without interruption, *i. e.* that the first runs, as among us, from left to right, and the second runs back from right to left, and so on to the end. (See BOUSTROPHEDON.) On the other side of the door is seen a bas relief in marble, tolerably well wrought: it represents a woman seated, to whom other women appear to offer children in swaddling clothes: behind these is seen another woman, holding a box in one hand and a vase in the other.

SIGEUM

SIGUEUM Promontorium, a promontory of the Troade. It is near to and north of the mouth of the river called Scamander. Strabo calls it the port of the Achæans, because the Greeks landed there in going to the siege of Troy. In the vicinity was a large lake, which was thought to communicate with the sea. This promontory is now called Yeni-Hisari.

SIGG, or **SIKKE**, in *Geography*, a river of Algiers, which, united with the Habrah, forms the Muckda, or, as it is first called, Makerra.

SIGGU, a town of Japan, in the island of Nippon; 65 miles N.E. of Meaco.

SIGHING, an effort of nature, by which the lungs are put into greater motion, and more dilated, so that the blood passes more freely, and in greater quantity, to the left auricle, and thence to the ventricle. Hence we learn, says Dr. Hales, how sighing increases the force of the blood, and consequently proportionably cheers and relieves nature, when oppressed by its too slow motion, which is the case of those who are dejected and sad. Hales's Statistical Ess. vol. ii. p. 6. See **LUNGS**.

SIGHT, the exercise, or act of the sense of seeing. See **EYE**.

Our sight, the noblest and most useful of all our senses, father Malebranche shews, deceives us in abundance of instances; nay, almost in all: particularly with regard to the magnitude and extent of things; their figures, motions, &c. Our eyes do not shew any thing less than a mite: half a mite is nothing, if we believe their report. A mite is only a mathematical point, with regard to it; and we cannot divide it, without annihilating it. In effect, our sight does not represent extension, such as it is in itself; but only the relation and proportion it has to our body. Hence, as half a mite has no relation to our bodies, and that it cannot either preserve or destroy us, our sight hides it entirely. Were our eyes made like microscopes, or were we ourselves as small as mites, we should judge very differently of the magnitude of bodies.

It may be added, that our own eyes are really no other than a kind of natural spectacles; that their humours do the same office as the lens in spectacles; and that, according to the figure of the crystalline, and its distance from the retina, objects are seen very differently by us; inasmuch that we are not sure, that there are any two persons in the world who see them equally big. It is even very rare, that the same person sees the same object equally big with both eyes; as both eyes are very seldom perfectly alike: on the contrary, we generally see things bigger with the left than the right eye; of which we have some very good observations in the journal of the learned at Rome, for the year 1669. See **VISION**.

The *Acta Leipsiensia* give us an account of a man, who received a smart stroke on the pupil of one of his eyes from the end of a fiddle-string, which broke while he was tuning the instrument, and chanced to fly that way. Some cooling things were applied to the eye, and a bandage used to shade it from the light; but at midnight the patient, chancing to wake in the dark, found that he could see with that eye, though not with the other: this continued a long time, and on trial he found that he could read a small print at midnight with this eye, but could scarcely distinguish any thing with it in a bright and clear day.

We have, in the same collections, an account of a man, who, after the cure of a confirmed pox, saw every object double for a long time. *Act. Leips. 1690.*

It is a very common, and a very just observation, that

children do not see any thing clearly when new-born; and if their eyes be then examined, they are found to want that brilliancy which they afterwards acquire; and finally, when any object is presented to their view, they at first turn their eyes about in such a manner, that it is evident they either do not see at all, or at best but very imperfectly and obscurely.

This imperfection may either be owing to a fault in some one of the humours, or in their capsules; or, finally, in the retina, or complexly in them all together. It is impossible to discover whether there be any imperfection in the retina in this state of life, that membrane being ever, in new-born infants, tender and soft like a jelly: if it be in any of the other parts that the imperfection lies, it must be either in their nature or extent. M. Petit, of the Academy of Sciences at Paris, determining to enquire thoroughly into the cause of this, was at the pains of dissecting the eyes of several infants which had died soon after their birth, and in three-fourths of them he found the vitreous, the crystalline, and the capsule, all greatly deficient in their transparency. The uvea appeared also more opaque than in adults, and the pupil over-large; and that there was either none, or, at the utmost, very little of the aqueous humour; and in those eyes where the humours had not this opacity, they were all, as were also the membranes, of a reddish colour; and this was observed in fetuses of seven and nine months old.

The cornea in these eyes was also remarkably thick, which is, in general, found to be the case in the eyes of all fetuses. The thickness and opacity in these corneæ gradually diminish in time, and that soon; so that the eyes of children appear much brighter at two or three months old than when new-born. The aqueous humour seems also, in most fetuses, to be wholly wanting; and where it is found, is ever greatly in an under proportion to the other humours.

It therefore appears, that the dimness and imperfection of sight, in new-born infants, are owing to the over-thickness of the cornea, and to the too small portion of the aqueous or watery humour. It appears plainly also, from experience, that the eye is not able, in infants, to bear the light, till the pupil is greatly contracted; as is the case also, though in a less degree, in adults; and it is very probable, that the extreme softness of the retina in this state may make every ray of light affect it much more plainly than when grown more firm.

M. Petit having continued his examinations of the eyes of infants, up to the age of five or six weeks, found in all his dissections, that the cornea daily grew more and more convex and glossy; and this may be rationally concluded to be owing to the daily increase of the aqueous humour, which must, by that accretion, throw it out into a greater convexity, and make it daily more and more thin and transparent. The uvea also acquires a greater extension, and its fibres become more moveable; whence the pupil acquires a power of enlarging or contracting itself, at the approach or absence of light, with much more ease and readiness than it could before. The humours thus all become capable of letting in a larger quantity of light; the retina is at the same time every day gaining a new firmness, and the pupil becomes capable of an easy dilatation, or restriction, for the letting in occasionally a greater or less number of rays, and the refractions are perfected by the augmentation of the aqueous humour. It is plain, therefore, that the clearness of vision must every day increase. All this change comes on in infants only by time; and it may be judged of, as to its state, by inspection, by the brilliancy and convexity of the cornea, and by the manner of their turning their eyes towards objects set before them; and this time is not cer-

tain, or limited, but differs greatly in different children, some being able to see clearly at the end of a month, others not till after many months.

At the time that this gentleman was dissecting the eyes of human fœtuses and infants, he also curiously observed the eyes of young quadrupeds. The puppy, when newly brought forth, has always its eyes opaque; the kitten, on the contrary, has them clear, and every way like those of adults of the same species. In fœtuses of other quadrupeds, the lamb has its cornea a little turbid and opaque; the calf and the pig have them more or less opaque, but the calf so most of all. Mem. de l'Acad. Par. 1727.

SIGHT, *Defects of*. See CATARACT; GUTTA Serena; LEUCOMA; OPHTHALMY; PTERYGIUM; TRICHIASIS; EYE, *Cancer and Extirpation of*; EPIPHORA; FISTULA Lachrymalis; STAPHYLOMA; HYPOPIUM; FUNGUS Hematodes; &c.

SIGHT, *Short*. See MYOPS and SHORT-SIGHTEDNESS.

SIGHT, *Second*. See SECOND Sight.

SIGHT, *Point of*. See POINT of View.

SIGHT, *Line of*. See COLLIMATION.

SIGHT. Singing or playing *at sight*, in *Music*, is the being prepared by long practice and experience for every difficulty, not only of execution, but styles and expression: as a person allowed to read well in a book which he has never seen, must not only pronounce the words correctly and distinctly, but observe the punctuation, and enter into the author's design. We do not always give credit to reports of diletant, or even every professor, performing *à vista*, or, as the French call it, *à livre ouvert*, all kinds of composition without study or practice. See GRETRY.

SIGHTS, in *Mathematics*, denote two thin pieces of brass, raised perpendicularly on the two extremes of an alidade or index of a theodolite, circumferentor, or other like instrument; each of which has an aperture or slit up the middle, through which the visual rays pass to the eye, and distant objects are seen. Their use is, for the just direction of the index to the line of the object.

Sometimes the slits or apertures have glasses or lenses fitted into them; in which case, they are called *telescopic* sights, by way of distinction from the former; which, in respect of the others, are denominated *plain* sights.

Mr. Flamsteed and Dr. Hooke absolutely exploded the use of plain sights in astronomical observations. The errors in Tycho's latitudes of the stars Mr. Flamsteed ascribes wholly to his using plain sights; and suspects, that Hevelius, using the same kind of sights, must fall into the like errors. Hevelius, on the contrary, in a paper in the Philosophical Transactions, vindicates the use of plain sights, and prefers them to telescopic ones: the main objection he makes to the latter is, that no observation can be safely taken with them, without first examining and rectifying them; in which examination, many and gross mistakes are likely to be committed. To which he adds, that in sextants, octants, azimuth quadrants, &c. he does not see how such examination can be made, at all times, without much loss of time.

SIGILLARIA, a solemn feast held among the ancient Romans; thus called from a custom which obtained therein, of sending little presents from one to another, consisting of seals, little figures, and sculptures, made of gold, silver, brass, or even earthenware, and of devoting them to Saturn, as an atonement for themselves and their friends.

The Sigillaria followed immediately after the Saturnalia, and held two days; which, with the five days of the Saturnalia, made a solemnity of seven days.

Some derive the origin of sigils and figures, in this solemnity, from the argei, or rushen figures of men, thrown an-

nually into the Tiber, from the Pons Sublicius, by the Vestals, on the ides of March. Vide Macrobi. Saturn. lib. i. cap. 7. 10. and 11. See also ARGEA.

SIGILLATA TERRA, a name given to several kinds of medicinal earths marked with seals, to express their being genuine. The principal is the Lemnian earth: this is a kind of earth, or bole, dug in the isle of Lemnos, and then also called Lemnian earth; of considerable use in medicine.

It was anciently found in a mountain, in the neighbourhood of the city Hephæstia, where Diana's priests went, at certain times, with great ceremony, to dig it up. After a little preparation, they made it up into troches, and sealed them with Diana's seal; whence the appellation of *sigillata*, sealed.

SIGILLO, in *Geography*, a town of Italy, in Umbria; 12 miles N. of Nocera.

SIGILLUM, a seal, or signet.

SIGILLUM Mariae, *Lady's Seal*, in *Botany*, a name by which some authors have called the *bryonia nigra*, or black bryony, a climbing plant, common in hedges.

SIGILMESSA, in *Geography*. See SUGULMESSA.

SIGINDUNUM, in *Ancient Geography*, a town of Upper Mœsia, on the banks of the Danube, according to Ptolemy. The Itinerary of Antonine marks it on the route from Rimini to Byzantium, between Taurunum and the mount of Gold.

SIGINNI, a people of Asia, who, according to Strabo, had the same manners with the Persians.

SIGISA, a town of Hispania, upon the Tader, N.W. of Vergilia.

SIGISMONDO, in *Biography*. See INDIA.

SIGISMUND, emperor of Germany, and king of Hungary and Bohemia, was the son of the emperor Charles IV. of the house of Luxemburg. He was born in the year 1366, and at an early age was sent to the court of Lewis, king of Hungary, to one of whose daughters he was betrothed, with the intention of making him successor to the throne. During his minority, a party of nobles conferred the crown on Charles, king of Naples, on which event Sigismund retired to Bohemia. Charles being assassinated by the contrivance of the queen-mother, who was put to death for the crime, Sigismund assembled an army, and entering Hungary, liberated his wife Mary, who had been imprisoned, and was crowned king when he was in the twentieth year of his age. He severely revenged the execution of his mother-in-law; and getting possession of the persons of the nobles who had invited Charles, he caused them all to be beheaded, to the number of thirty-two. The bloody act occasioned so much disaffection, that the Turkish emperor Bajazet determined upon taking the opportunity of invading Hungary, which he did with complete success; and Sigismund was dethroned. He however escaped, and retiring to Bohemia, levied troops, with which he recovered his crown, and being brought to reason by adversity, he thenceforth conducted himself so as to obtain the goodwill of his people; and such was the reputation which he now acquired abroad, that he was elected emperor of Germany.

The first object of Sigismund in his new dignity, was to put an end to various disorders and dissensions which prevailed in Germany. He held a conference with pope John XXIII. for the convoking of a council, the principal object of which was the termination of the schism in the papacy which had long divided the church. He engaged with great zeal in this matter, and at length effected the assembling of a council at Constance, in 1414, at which he himself assisted. As the opposition of the Hussites to the doctrines

of Rome was now making great progress, the emperor granted a safe-conduct to John Hufs to come to the council, and defend the articles of his faith; and it will be to his everlasting disgrace, that he suffered the council to violate the protection he had solemnly given, and to bring this reformer to the stake. He now endeavoured to re-establish peace among the Christian princes, that they might concur in a plan for restoring the unity of the church: with this view he visited both France and England, then at war with each other, but with little success. The council, however, agreed in deposing the existing popes, and electing a new one. Upon the death of his brother Wenceslaus, in 1419, Sigismund succeeded to the crown of Bohemia, which country was in a flame, from the revolt of the persecuted Hussites, under their leader the famous Ziska. He marched with an army into Bohemia, but was entirely defeated by Ziska, and the same fortune attended him a second time. After the death of that hero, a long series of bloody wars succeeded, which at last terminated in the submission of the *Thaborites*, as the insurgents were afterwards called, and Sigismund was crowned at Prague, in the year 1436, and reduced the whole kingdom to obedience. He had some years before this received the imperial crown both at Milan and at Rome. His bigotry urged him to tyrannical proceedings against his Bohemian subjects, which excited their animosity to such a degree, that he determined to leave the country. When he was just upon the point of putting this resolution into execution, he was seized with a mortification in his toes, which was the preface to approaching dissolution, and having publicly declared his son-in-law, Albert, duke of Austria, the heir to his dominions, he died in December 1437, in the 71st year of his age, and the 27th of his imperial dignity. Sigismund is said to have had a fine person, and to have possessed various accomplishments, especially an uncommon skill in the learned languages. He was, moreover, a patron of learned men, was liberal, brave, and active; but, on the other hand, he was cruel, vindictive, and superstitiously devoted to the clergy. He was licentious in his conduct, the consciousness of which made him indulgent to the open and abandoned debauchery of his second wife, Barbara de Cilly, denominated the Messalina of Germany.

SIGISMUND I. king of Poland, surnamed the *Great*, was the son of Casimir IV. He succeeded his brother Alexander in 1507, and immediately applied himself to the remedying of abuses that had crept into the administration of public affairs. In this arduous task he was assisted by the able and faithful minister John Bonner, whose name is still held in veneration by the Poles. A rebellion in Lithuania, abetted by the czar of Muscovy, joined to an incursion of the Walachians and Moldavians, obliged him to put himself at the head of the troops, and he completely succeeded against his enemies. The next antagonist with whom he had to contend, was the marquis of Brandenburg, grand-master of the Teutonic order, who had refused to acknowledge the sovereignty of the king of Poland over the province of Prussia: in this dispute he was also successful, and obliged the marquis to grant him half the province of Prussia, as a barrier against the Teutonic knights. Sigismund now sat down the peaceful sovereign of Poland, Lithuania, the duchies of Smolensko and Severia, and considerable territories on the Euxine and Baltic, while his nephew Lewis was king of Hungary and Bohemia. This accumulation of power gave umbrage to the house of Austria; which, by its intrigues, incited the Walachians, Tartars, and Muscovites, to make new inroads. These, however, were soon driven back with great loss to their own countries, and Sigismund left again in peace. He died, after a wife, fortunate, and

long reign, in the eighty-fourth year of his reign, and in the year 1548.

SIGISMUND II. named Augustus, king of Poland, son of the preceding, was elected to the crown before his father's death. He offended the nobles by marrying the widow of an obscure person; and it is asserted, that, in order to recover their favour, he permitted them to send their sons for education to the Protestant universities of Germany, which was the means of introducing their opinions into Poland. He himself remained attached to the old religion, and by his prudent and moderate conduct kept out of the kingdom those disorders which disturbed the peace of so many other European countries. He was extremely diligent in promoting the improvement of his states by wise laws and regulations, and the correction of abuses, which enabled him to maintain a powerful standing army without the addition of new taxes. This force he had occasion to employ as an auxiliary to his kinsman the archbishop of Riga, against an invasion of the Russians. He made himself master of great part of Livonia, and forced the grand-master of the Teutonic order, who had called in the Russians, to renounce their alliance, and put the order under the protection of Poland. From this period Livonia was annexed to Poland, and the grand-master abdicating his dignity, received in compensation the duchies of Courland and Semigallia, which long remained in his family. The czar, John Basilowitch, made an irruption into Lithuania, which occasioned much bloodshed and devastation, and Sigismund was glad to propose an armistice; and while this measure was in discussion, the king of Poland died in 1572, leaving only two daughters, and with him terminated the male line of the house of Jagellon. He left a high character for courage, ability, and every princely quality, but he is said to have been too much attached to the fair sex.

SIGISMUND III. king of Poland, surnamed *De Vasa*, was the son of John III. king of Sweden, and Catharine, daughter of Sigismund I. king of Poland. He was born in 1566, and in 1587 was elected to the crown of Poland, in competition with Maximilian of Austria. Through the exertions of Zamoski, the crown-general, after a civil war, in which Maximilian was defeated and taken prisoner, Sigismund was firmly seated on the throne. He governed successfully with the assistance of Zamoski, till the death of his father, in 1592, left him heir to the crown of Sweden. As he was a zealous Catholic, and the Swedes were friendly to the Reformation, they felt disinclined to come under his authority; besides that, the duties of a king of Sweden, and of a king of Poland, seemed to be quite incompatible. His uncle, duke Charles, who had been declared regent during Sigismund's absence, inflamed those discontents. Sigismund having obtained permission from the Polish diet to visit his other kingdom, arrived in Sweden in 1593, accompanied by the pope's nuncio, and his proceedings soon proved how much the restoration of the Catholic religion was the object of his wishes. Violent dissensions arose between him and the states, and in 1595 he returned to Poland, leaving Sweden in the greatest disorder. In 1598, Sigismund again entered Sweden at the head of a foreign army, and a civil war ensued, which terminated in a pacification, and the king returned to Poland. Peace did not last long, and in 1604 the Swedes formally deposed him, and raised his uncle Charles to the throne. War succeeded between Poland and Sweden, which ended in the conquest of Livonia by the Polish general.

Russia, at this time, being thrown into confusion by a revolution, Sigismund took part in its disorders, and entering that country, in 1610, at the head of a numerous army,

gained in the outlet such advantages, that he was enabled to place his son Uladiflaus on the throne. He was, however, soon after dethroned, and all the conquests made by Sigismund were recovered by the Russians. During the remainder of his reign, the Poles were involved in wars with the Turks, and afterwards with the Swedes under Gustavus Adolphus. To the latter they were obliged to cede Livonia, Finland, and Prussia; and the concluding years of Sigismund were clouded with disasters. He fell into a state of melancholy and disease, by which he was carried off, in the year 1669. His character has been thus drawn in very few words: "With some talents for government, his religious bigotry, and obstinacy of temper, precipitated him into errors which cost him one crown, and rendered the other a source of perpetual disquiet."

SIGIUS, in *Ancient Geography*, a town of Italy, on the coast of Ausonia, according to Appian.

SIGIUS Mons, or *Setius*, according to Ptolemy, a mountain of Gallia Narbonnensis, on the coast of the Mediterranean sea. Strabo.

SIGMA, among the *Romans*, the same with the *stibadium*.

SIGMARINGEN, in *Geography*, a town and county of Germany, invested in the house of Hohenzollern, on the Danube; 44 miles E. of Stuttgart. N. lat. 48° 2'. E. long. 9° 16'.

SIGMOID, in *Anatomy*, an epithet applied to various parts of the body, from their figure being similar to that of the Greek letter σ . Thus, we have the sigmoid cavities of the ulna (see *EXTREMITIES*); sigmoid flexure of the colon (see *INTESTINE*); and sigmoid valves of the aorta and pulmonary artery. See *HEART*.

SIGN, **SIGNUM**, a sensible mark, or character, denoting something absent or invisible.

Anciently the monks, in all religious houses, were not allowed to speak, nor to express their minds, otherwise than by signs, which they learned in their noviciate. C. Rhodiginus and Porta have written of the ancient signs and cyphers used in speaking and writing.

SIGN, in *Algebra*, denotes a symbol, or character.

SIGNS, like, negative, and radical. See the adjectives.

SIGN, in *Medicine*, any appearance in a disease which is cognizable by the senses, and from which some judgment may be formed respecting the nature of the disease, and its probable termination. It is now more commonly called a *symptom*; which see.

SIGN, *Antecedent*. See *ANTECEDENT*.

SIGN, in *Astronomy*, a twelfth part of the ecliptic, or zodiac; or a portion, containing thirty degrees of it.

The zodiac was divided, by the ancients, into twelve segments, called signs; commencing from the point of intersection of the ecliptic and equinoctial; which signs they denominated from the twelve constellations, which, in Hipparchus's time, possessed those segments. But the constellations have since so changed their places, by the precession of the equinox, that Aries is now got out of the sign called Aries, into Taurus, Taurus into Gemini, &c.

The names of the twelve signs, and their order, are as follow: *Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius, Pisces*; each of which, with the stars thereof, see under its proper article, *ARIES, TAURUS*, &c.

The signs are distinguished, with regard to the season of the year when the sun is in them, into *vernal, æstival, autumnal*, and *brumal*.

SIGNS, the *vernal*, or *spring*, are, Aries, Taurus, Gemini.

SIGNS, the *æstival*, or *summer*, are, Cancer, Leo, and Virgo.

SIGNS, the *autumnal*, are, Libra, Scorpio, and Sagittarius.

SIGNS, the *brumal*, or *winter*, are, Capricornus, Aquarius, and Pisces.

The vernal and summer signs are also called *northern* signs.

And the autumnal and brumal signs, *southern* signs.

SIGNS, *Ascending*. See *ASCENDING*.

SIGNS, *Fixed*. See *FIXED*.

SIGNS, *Masculine*. See *MASCULINE*.

SIGN Manual, the setting one's hand and seal to a writing. See *SIGNATURE*.

The expression is used when any bill or writing is signed under the hand of the king, &c. Counterfeiting the sign manual, privy signet, or privy seal, is treason. 1 Mar. stat. 2. cap. 6. See *PATENTS*.

Among the Saxons, before the invention of seals, a + was a common sign, or *figum*, prefixed to the names of most subscribing witnesses in charters, and other deeds: as + *figum Roberti Episcop. Lond. &c.* See *SEAL*.

SIGN of Reference, in *Music*, *signa repetitionis*. See *SEGNO*.

SIGNS of Disease in Horses, the appearances which shew them to be out of order. The first sign of a horse's indisposition is, his loathing his food, especially when he has a wild and haggard look; as the eye of a horse is, as it were, a glass, through which may be discerned the inward disposition of his body: it should also be observed whether his ears be cold, his mouth hot or clammy, the hair of his flanks rough and staring, and paler than usual about the ends; his dung hard, black, or greenish, and his urine clear like water. In this case his eyes are also subject to weep; his head is heavy and hanging down; he is apt to stumble as he walks; he is slow and dull, though he was vigorous before; he never minds other horses; contrary to his former custom, he rises and lies down often in the stable, looking towards his flanks, which are doubled and folded in; his heart beats quick; and he is also indifferent and unconcerned at what is done to him. These and many other signs are met with in horses which are not in a state of perfect health, and should be immediately attended to; and suitable remedies be applied. This is of much consequence to be taken care of in team and other work horses belonging to farms, &c.

SIGNA, **STANDARDS**, among the Romans, were of different sorts; on some of them the image of the emperor was represented, and they that carried them were called *imaginiferi*; others had a hand stretched out, as a symbol of concord; and these ensign-bearers were called *signiferi*; some had a silver eagle, the bearers of which were called *aquiliferi*; others had a dragon with a silver head, and the rest of his body of taffety, which was blown by the wind as if it had been a real dragon, and the bearers of this ensign were called *draconarii*; lastly, the emperor's ensign was called *labarum*, and those that carried it *labariferi*, which they carried out when he went in person to the field; it was of a purple colour, beset with gold fringe, and adorned with precious stones.

All these ensigns were sustained with a half-pike, sharp at the end, that it might be the more easily fixed in the ground.

SIGNAL, a certain sign agreed upon for the conveying of intelligence to places to which the voice cannot reach.

Signals are given for the beginning of a battle, or an attack; usually with drums and trumpets: at sea, they are given by cannon or musket-shot, by lights, sails, flags, &c.

All signals may be reduced into three different kinds; viz. those which are made by the sound of particular instruments, as the trumpet, horn, or fife; to which may be added, striking

SIGNALS.

striking the bell, or beating the drum; those which are made by displaying pendants, ensigns, and flags, of different colours; or by lowering or altering the position of the sails; and those which are executed by rockets of different kinds; by firing cannon or small arms; by artificial fire-works; and by lanthorns. See TELEGRAPH.

The signals by the drum, made use of in military exercise, instead of the word of command, are as follow: a short roll, *q. d.* to caution; a *flam*, to perform any distinct operation; to arms, to form the line or battalion; the march, to advance, except when intended for a salute; the quick march, to advance quick; the point of war, to march and charge; the retreat, to retreat; drum ceasing, to halt; two short rolls, to perform the flank-firing; the dragoon march, to open the battalion; the grenadier march, to form the column; the troop, to double divisions; the long roll, to form the square; the grenadier march, to reduce the square to the column; the preparative, to make ready and fire; the general, to cease firing; two long rolls, to bring or lodge the colours.

Signals have been in use in all ages: the ancients, who had no regular couriers, or posts, made use of them to convey intelligence of what passed at a great distance; for which purpose, they placed sentinels on the eminences, from space to space; some mention of which we find made by Homer himself, *Iliad* Θ . v. 553, &c. *Odyss.* Ξ . v. 261. Those people, thus disposed, lighted fires, or flambeaux, in the night-time. In the *Agamemnon* of *Æschylus*, that prince, at his departure for Troy, promises *Clytemnestra*, that, the very day the city should be taken, he would apprise her of his victory by fires, lighted exprefs. He keeps his word, and tidings are brought the princess, that Troy is taken, and that *Agamemnon's* signals are seen.

Frontinus observes they were in use among the Arabs; and *Bonaventura Vulcanius*, in his scholia on *Aristotle's* book *De Mundo*, adds, that, while the Moors were masters of the greatest part of Spain, they built on the tops of the mountains an infinity of turrets, or watch-houses, called, in the Arabic, *atalayas*, a word the Spaniards still retain; whence, by fires, they could immediately alarm the whole kingdom. Indeed the custom was much more ancient than the Moors in Spain. *Q. Curtius* observes, it was very frequent among the Asiatics, in the time of *Alexander*: *Livy* and *Cæsar*, also, both mention it as used among the Romans. *Polydore Virgil* shews it of great antiquity in England; and *Boethius* adds, that, in several places in England, there were the remains of huge poles that have served for this purpose.

SIGNALS at Sea, are signs made by the admiral, or commander-in-chief of a squadron of ships, either in the day, or by night, whether for sailing, for fighting, or for the better security of the merchant-ships under their convoy. See ENGAGEMENT.

These signals are very numerous, and important; being all appointed and determined by order of the lord high admiral, and lords of the admiralty, and communicated in the instructions sent to the commander of every ship of the fleet, or squadron, before their putting out to sea. It is by the combination of signals, previously known, that the admiral conveys orders to his fleet; every squadron, every division, and every ship of which has its particular signal. The instruction may, therefore, occasionally be given to the whole fleet, or to any of its squadrons, to any division of those squadrons, or to any ship of those divisions. Hence the signal of command may at the same time be displayed for three divisions, and for three ships of each division; or for three ships in each squadron, and for only nine ships in the whole

fleet. For, the general signal of the fleet being shewn, if a particular pendant be also thrown out from some remarkable place on the same mast with the general signal, it will communicate intelligence to nine ships that wear the same pendant.

The preparatory signal given by the admiral to the whole, or any part of his fleet, is immediately answered by those to whom it is directed; by shewing the same signal, to testify that they are ready to execute his orders. Having observed their answers, he will shew the signal which is to direct their operations: as, to chase, to form the line, to begin the engagement, to board, to double upon the enemy, to rally or return to action, to discontinue the fight, to retreat and save themselves. The dexterity of working the ships in a fleet depends on the precise moment of executing these orders, and on the general harmony of their movements; a circumstance which evinces the utility of a signal of preparation.

As the extent of the line of battle, and the fire and smoke of the action, or other circumstances in navigation, will often prevent the admiral's signals from being seen throughout the fleet, they are always repeated by the officers next in command; by ships appointed to repeat signals; and, finally, by the ship or ships for which they are intended. The ships that repeat the signal, besides the chiefs of squadrons or divisions, are usually frigates lying to windward or leeward of the line. These should be extremely vigilant to observe and repeat the signals, whether they are to transmit the orders of the commanders-in-chief, or his seconds, to any part of the fleet; or to report the fortunate or distressful situation of any part thereof. By this means, all the ships from the van to the rear will, unless disabled, be ready at a moment's warning to put the admiral's design in execution. To preserve order in the repetition of signals, and to favour their communication, without embarrassment, from the commander-in-chief to the ship for which they are designed, the commanders of the squadrons repeat after the admiral; the chiefs of the divisions, according to their order in the line, after the commanders of the squadrons; and the particular ships, after the chiefs of the divisions; and those, in return, after the particular ships, *vice versa*, when the object is to convey any intelligence from the latter to the admiral. Besides the signals above-mentioned, there are others for different ranks of officers; as for captains, lieutenants, masters, &c. or for any of those officers of a peculiar ship. Falconer.

Signal-flags are hoisted at the mizen-peek, &c.; night-signals are made with lanthorns, and are hoisted by the same haliards as the flags. Since November 1805, the red flag at the main-mast has been the first in rank after the union flag. See FLAG.

SIGNALS by Day. When the commander-in-chief would have them prepare for sailing, he first looses his fore-top-sail, and then the whole fleet is to do the same. When he would have them unmoor, he looses his main-top-sail, and fires a gun, which, in the royal navy, is to be answered by every flag-ship. When he would have them weigh, he looses his fore-top-sail, and fires a gun, and sometimes hauls home his sheets; the gun is to be answered by every flag-ship, and every ship is to get to sail as soon as it can. If with the leeward-side, the sternmost ship is to weigh first. When he would have the weather-moist and head-moist ships to tack first, he hoists the union-flag at the fore-top-mast-head, and fires a gun, which each flag-ship answers; but if he would have the stern-moist and leeward-moist ships to tack first, he hoists the union-flag at the mizen-top-mast-head, and fires a gun; and when he would have all the whole fleet tack, he hoists an union both on the fore and mizen-top-mast-heads, and fires a gun. When, in bad weather, he would

SIGNALS.

would have them wear, and bring to the other tack, he hoists a pendant on the ensign-staff, and fires a gun; and then the leeward-most and stern-most ships are to wear first, and bring on the other tack, and lie by, or go on with an easy sail, till he comes a-head: every flag is to answer with the same signal. If they are lying by, or failing by a wind, and the admiral would have them bear up and sail before the wind, he hoists his ensign, and fires a gun, which the flags are to answer; and then the leeward-most ships are to bear up first, and to give room for the weather-most to wear, and sail before the wind, with an easy sail, till the admiral comes a-head. But if it should happen, when the admiral hath occasion to wear and sail before the wind, that both jack and ensign be abroad, he will haul down the jack, before he fires the gun to wear, and keep it down till the fleet is before the wind. When they are failing before the wind, and he would have them bring-to, with the starboard tacks aboard, he hoists a red flag at the flag-staff, on the mizen-topmast-head, and fires a gun. But if they are to bring-to, with the larboard tack, he hoists a blue flag at the same place, and fires a gun, and every ship is to answer the gun. When any ship discovers land, he is to hoist his jack and ensign, and keep it abroad, till the admiral or commander-in-chief answer him, by hoisting his; on sight of which, he is to haul down his ensign. If any discovers danger, he is to tack and bear up from it, and to hang his jack abroad from the main-topmast cross-trees, and to fire two guns; but if he should strike or stick fast, then, besides the same signal with his jack, he is to keep firing, till he sees all the fleet observe him, and endeavour to avoid the danger. When any sees a ship or ships more than the fleet, he is to put abroad his ensign, and there keep it, till the admiral's is out, and then to lower it, as often as he sees ships, and stand in with them, that so the admiral may know which way they are, and how many; but if he be at such a distance, that the ensign cannot well be discovered, he is then to lay his head toward the ship or ships so descried, and to brail up his low sails, and continue hoisting and lowering his topmasts, and making a waft with his top-gallant sails, till he is perceived by the admiral. When the admiral would have the vice-admiral, or him that commands in the second post of the fleet, to send out ships to chase, he hoists a flag, striped white and red on the flag-staff, at the fore-topmast-head, and fires a gun. But if he would have the rear-admiral do so, he then hoists the same signal on the flag-staff at the mizen-topmast-head, and fires a gun. When the admiral would have any ship to chase to windward, he makes a signal for speaking with the captain, and he hoists a red flag in the mizen shrouds, and fires a gun; but if to chase to leeward, a blue flag; and the same signal is made by the flag, in whose division that ship is. When he would have them give over chase, he hoists a white flag on his flag-staff at the fore-topmast-head, and fires a gun; which signal is to be made also by that flag-ship which is nearest the ship that gives chase, till the chasing ship sees the signal. In case of springing a leak, or any other disaster, that disables their ship from keeping company, they are to haul up their courses, and fire two guns. When any ship would speak with the admiral, he must spread an English ensign, from the head of his main or fore-topmast, downwards on the shrouds, lowering his main or fore-topmast, and continue firing guns, till the admiral observe him; and if any ship perceive this, and judgeth the admiral doth not, that ship must make the same signal, and make the best of his way to acquaint the admiral therewith, who shall answer by firing one gun. When the admiral would have the fleet to prepare to anchor, he hoists an ensign, striped red, blue, and

white, on the ensign-staff, and fires a gun; and every flag-ship makes the same signal. If he would have the fleet moor, he hoists his mizen-topmast, with the clew-lines hauled up; and fires a gun. If he would have the fleet cut or slip, he looses both his topmasts, and fires two guns; and then the leeward ships are to cut or slip first, to give room to the weather-most to come to sail. So if he would have any particular ship to cut or slip, and to chase to windward, he makes the signal for speaking with that ship, hoists a red flag in the mizen-shrouds, and fires a gun; but if a ship is to chase to leeward, he hoists a blue flag as before. If he would have the fleet exercise their small arms, he hoists a red flag on the ensign-staff, and fires a gun; but if the great guns, then he puts up the pendant over the red flag.

SIGNALS by Night, to be observed at an anchor, weighing anchor, and failing, are as follow. When the admiral would have the fleet to unmoor, and ride short, he hangs out three lights, over one another in the main-topmast-shrouds, over the constant light in the main-top, and fires two guns, which are to be answered by the flag-ships; and each private ship hangs out a light in the mizen-shrouds. Note, that all guns, fired for signals in the night, must be fired on the same side, that they may make no alteration in the sound. When he would have them weigh, he hangs a light in the main-topmast-shrouds, and fires a gun, which is to be answered by all the flags; and every private ship must hang out a light in his mizen-shroud. When he would have them tack, he hoists two flags on the ensign-staff, over one another, above the constant light in his poop, and fires a gun, which is to be answered by all the flags; and every private ship is to hang out a light extraordinary, which is not to be taken in, till the admiral takes in his. After the signal is made, the leeward-most and stern-most ships must tack as fast as they can; and the stern-most flag-ship, after he is about on the other tack, is to lead the fleet, and him they are to follow, to avoid running through one another in the dark. When he is upon a wind, and would have the fleet veer, and bring-to on the other tack, he hoists up one light at the mizen-peek, and fires three guns; which is to be answered by all the flag-ships; and every private ship must answer, with one light at the mizen-peek. The stern-most and leeward-most ships are to bear up so soon as the signal is made. When he would have them, in blowing weather, to lie a-try, short, or a-hull, or with the head-sails braced to the mast, he will form lights of equal height, and fire five guns, which are to be answered by the flag-ships, and then every private ship must shew four lights; and after this, if he would have them to make fail, he then fires ten guns, which are to be answered by all the flags, and then the head-most and weather-most ships are to make fail first. When the fleet is failing large, or before the wind, and the admiral would have them bring-to, and lie by, with their starboard tacks aboard, he puts out four lights in the fore-shrouds, and fires six guns; but if with the larboard tacks aboard, he fires eight guns, which are to be answered by the flag-ships; and every private ship must shew four lights. The wind-most ships must bring-to first. Whenever the admiral alters his course, he fires one gun, without altering his lights, which is to be answered by all the flag-ships. If any ship hath occasion to lie short, or by, after the fleet hath made fail, he is to fire one gun, and shew three lights in his mizen-shrouds. When any one first discovers land, or danger, he is to shew as many lights as he can, to fire one gun, and to tack, or bear away from it; and if any one happen to spring a leak, or any be disabled from keeping company with the fleet, he hangs out two lights of equal height, and fires guns till he is relieved by

SIGNALS.

by some ship of the fleet. If any one discovers a fleet, he is to fire guns, make false fires, put one light out on the main-top, three on the poop, to steer after them, and to continue firing of guns, unless the admiral call him off, by steering another course, and fire two or three guns, for then he must follow the admiral. When the admiral anchors, he fires two guns, a small space of time one from the other, which are to be answered by the flag-ships, and every private ship must shew two lights. When the admiral would have the fleet to moor, he puts a light on each top-mast-head, and fires a gun, which is to be answered by the flag-ships, and every private ship is to shew one light. If he would have them lower their yards and topmast, he hoists one light upon his ensign-staff, and fires one gun, which is to be answered by the flag-ships; and every private ship must shew one light. And when he would have them hoist their yards and topmasts, he puts out two lights, one under the other, in the mizen-topmast-shrouds, and fires one gun, which is to be answered by the flag-ships; and each private ship must shew one light in the mizen-shrouds. If any strange ship be discovered coming into the fleet, the next ship is to endeavour to speak with her, and bring her to an anchor, and not suffer her to pass through the fleet. And if any one discovers a fleet, and it blows so hard that he cannot come to give the admiral timely notice, he is to hang out a great number of lights, and to continue firing gun after gun, till the admiral answers him with one. When the admiral would have the fleet to cut or slip, he hangs out four lights, one at each main-yard-arm, and at each fore-yard-arm, and fires two guns, which are to be answered by the flag-ships; and every private ship is to shew one light.

SIGNALS used when a Ship sails in a Fog. If the admiral would have them weigh, he fires ten guns; which every flag-ship is to answer. To make them tack, he fires four guns, which are to be answered by the flag-ships; and then the leeward-most and stern-most ships must tack first, and after they are about, to go with the same sail they tacked with, and not to lie by, expecting the admiral to come a-head; and this is to avoid the danger of running through one another in thick weather.

When the admiral brings-to, and lies with his head-fails to the mast; if with the starboard tack aboard, he fires six guns; but if with the larboard tack, he fires eight guns, which the flag-ships are to answer. And after this, if he makes sail, he fires ten guns, which the flag-ships must answer, and then the head-most and weather-most ships are to make sail first. If it grow thick and foggy weather, the admiral will continue failing, with the same fail set that he had before it grew foggy, and will fire a gun every hour, which the flag-ships must answer; and the private ships must answer, by firing of muskets, beating of drums, and ringing of bells. But if he be forced to make either more or less sail than he had, when the fog began, he will fire a gun every half-hour, that the fleet may discern whether they come up with the admiral, or fall astern of him; and the flags and private ships are to answer, as before. If any one discovers danger, which he can avoid, by tacking and standing from it, he is to make the signal for tacking in a fog; but if he should chance to strike, and stick fast, he is to fire gun after gun, till he thinks the rest have avoided the danger. When the admiral would have the fleet to anchor, he fires two guns, which the flags are to answer; and after he hath been half an hour at an anchor, he will fire two guns more, to be answered by the flags as before, that all the fleet may know it.

SIGNALS for calling Officers on board the Admiral. When the admiral puts abroad an union-flag in the mizen-shrouds,

and fires a gun, all the captains are to come aboard him; and if, with the same signal, there be also a waft made with the ensign, then the lieutenant of each ship is to come on board. If an ensign be put abroad in the same place, all the masters of the ships of war are to come on board the admiral. If a standard on the flag-staff be hoisted at the mizen-topmast-head, and a gun fired, then all the flag-officers are to come aboard the admiral. If the English flags only, then a standard in the mizen-shrouds, and fire a gun: if the flags, and land general officers, then the admiral puts abroad a standard at mizen-topmast-head, and a pendant at mizen-peek, and fires a gun. If a red flag be hoisted in the mizen-shrouds, and a gun fired, then the captains of his own squadron are to come aboard the admiral; and if, with the same signal, there be also a waft with the ensign, the lieutenant of each ship must come aboard. If he hoists a white flag, as before, then the vice-admiral, or he that commands in the second post, and all the captains of his squadron, are to go on board the admiral; if a blue flag, &c. then the rear-admiral, and the captains of his squadron, must come aboard, and if with a waft, as before, the lieutenants. When a standard is hoisted on the ensign-staff, and a gun fired, the vice and rear-admirals must come on board the admiral's ship. When the admiral would speak with the captains of his own division, he will hoist a pendant on the mizen-peek, and fire a gun; and if with the lieutenants, a waft is made with the ensign, and the same signal; for whenever he would speak with the lieutenants of any particular ship, he makes the signal for the captain, and a waft also with the ensign. When the admiral would have all the tenders in the fleet come under his stern, and speak with him, he hoists a flag, yellow and white, at the mizen-peek, and fires a gun. But if he would speak with any particular ship's tender, he makes a signal for speaking with the captain she tends upon, and a waft with the jack. If all the pinnaces and barges are to come on board, manned and armed, the signal is a pendant on the flag-staff, hoisted on the fore-topmast-head, and a gun fired; and if he would have them chase any ship, vessel, or boat in view, he hoists the pendant, and fires two guns. The signal for the long-boats to come on board him, manned and armed, is the pendant hoisted on the flag-staff, and the mizen-topmast-heads, and a gun fired; and if he would have them chase any ship, vessel, or boat, in open view, without coming on board him, he hoists the pendant, as aforesaid, and fires two guns. When the admiral would have all the boats in the fleet to come on board him, manned and armed, he hoists a pendant on the flag-staff, both on the fore-topmast and mizen-topmast-head, and fires one gun; but if he would have them chase, he hoists his pendants, as before, and fires two guns. When the admiral would speak with the victualler, or his agent, he puts an English ensign in the mizen-topmast-shrouds; and when with him that hath the charge of the gunner's stores, he will spread an ensign at his main-topfail-yard-arm.

SIGNALS for managing a Sea-fight. When the admiral would have the fleet form a line of battle, one ship a-head of another, he hoists an union flag on the mizen-peek, and fires a gun; and every flag-ship does the like. But when they are to form a line of battle, one a-breast of another, he hoists a pendant with the union-flag, &c. When he would have the admiral of the white, or him that commands in the second post, to tack, and endeavour to gain the wind of the enemy, he spreads a white flag under the flag at the main-topmast-head, and fires a gun; and when he would have the vice-admiral of the blue do so, he doth the same with the blue flag. If he would have the rear-admiral of the

the red do so, he spreads a red flag from the cap, on the fore-topmast-head, downward on the back-stay; if the vice-admiral of the blue, he spreads a blue flag, &c. and fires a gun. If he would have the rear-admiral of the red do so, he hoists a red flag at the flag-staff, at the mizen-topmast-head; if the rear-admiral of the white, a white flag; if the rear-admiral of the blue, a blue flag, and under it a pendant of the same colour, with a gun. If he be to leeward of the fleet, or any part of it, and he would have them bear down into his wake or grain, he hoists a blue flag at the mizen-peek, and fires a gun. If he would be to leeward of the enemy, and his fleet or any part of it be to leeward of him, in order to bring these ships into the line, he bears down with a blue flag at the mizen-peek, under the union-flag, (which is the signal for battle,) and fires a gun; and then those ships that are to leeward of him, must endeavour to get into his wake or grain, according to their station in the line of battle. When the fleet is sailing before the wind, and he would have him, who commands in the second post, and the ship of the starboard quarter, to clap by the wind, and come to the starboard tack, he hoists a red flag at the mizen-topmast-head; but a blue one, if he would have ships of the larboard quarter come to the larboard tack, with a gun. If the van are to tack first, he spreads the union-flag at the flag-staff, on the fore-topmast-head, and fires a gun, if the red flag be not on board; but if it be, then he lowers the fore-topmasts a little, and the union-flag is spread from the cap of the fore-topmast downward; and every flag-ship doth the same. If the rear be to tack first, he hoists the union-flag on the flag-staff, at the mizen-topmast-head, and fires a gun; which all the flag-ships are to answer. If all the flag-ships are to come into his wake or grain, he hoists a red flag at his mizen-peek, and fires a gun; and all the flag-ships must do the same. If he would have him that commands in the second post of his squadron to make more sail, (though he himself shorten sail,) he hoists a white flag on the ensign-staff. But if he that commands in the third post be to do so, he hoists a blue flag, and fires a gun, and all the flag-ships must make the same signal. Whenever he hoists a red flag on the flag-staff at the fore-topmast-head, and fires a gun, every ship in the fleet must use their utmost endeavour to engage the enemy, in the order prescribed them. When he hoists a white flag at his mizen-peek, and fires a gun, then all the small frigates of his squadron, that are not of the line of battle, are to come under the stern. If the fleet be sailing by a wind in the line of battle, and the admiral would have them brace their head-sails to the mast, he hoists up a yellow flag, on the flag-staff, at the mizen-topmast-head, and fires a gun; which the flag-ships are to answer; and then the ships in the rear must brace first. After this, if he would have them fall their head-sails, and stand on, he hoists a yellow flag on the flag-staff of the fore-topmast-head, and fires a gun, which the flag-ships must answer; and then the ships in the van must fall first, and stand on. If, when this signal is made, the red flag at the fore-topmast-head be abroad, he spreads the yellow flag under the red. If the fleets being near one another, the admiral would have all the ships to tack together, the sooner to lie in a posture to engage the enemy, he hoists an union-flag on the flag-staves at the fore and mizen-topmast-heads, and fires a gun; and all the flag-ships are to do the same. The fleet being in a line of battle, if he would have the ship that leads the van hoist, lower, set, or haul up any of her sails, he spreads a yellow flag, under that at his main-topmast-head, and fires a gun, which signal the flag-ships are to answer; and the admiral will hoist, lower, set, or haul up the sail, which he would have the ship that leads the van

do; which is to be answered by the flag-ships of the fleet. When the enemies run, and he would have the whole fleet follow them, he makes all the sail he can after them himself, takes down the signal for the line of battle, and fires two guns out of his fore-chase, which the flag-ships answer; and then every ship is to endeavour to come up with and board the enemy. When he would have the chase given over, he hoists a white flag at the fore-topmast-head, and fires a gun. If he would have the red squadron draw into a line of battle, one abreast of another, he puts abroad a flag, striped red and white, on the flag-staff at the main-topmast-head, with a pendant under it, and fires a gun; if the white or second squadron is to do so, the flag is striped red, white, and blue; if the blue or third squadron is to do so, the flag is a Genoese ensign and pendant; but if they are to draw into a line of battle, one a-head of another, the same signals are made with a pendant. If they are to draw into the line of battle one a-stern of another, with a large wind, and he would have the leaders go with the starboard tacks, aboard by the wind, he hoists a red and white flag at the mizen-peek, and fires a gun; but if they should go with the larboard tacks aboard, by the wind, he hoists a Genoese flag at the same place; which signals, like others, must be answered by the flag-ships.

SIGNATOIRES, among the Romans, witnesses who sealed wills and marriage contracts.

SIGNATURE, *SIGNATURA*, *Signing*, a subscription, or putting of one's name at the bottom of an act, or deed, in one's own hand-writing.

Anciently, when very few people could write, they dispensed with the use of signatures; and contented themselves with the party's seal. See **DEED**.

SIGNATURE of the Court of Rome, is a supplication answered by the pope, by which he grants a favour, dispensation, or collation to a benefice, by putting the *fiat* at the bottom of it, in his own hand; or the *concessum est* written in his presence. This signature, at the bottom of the supplication, gives name to the whole instrument.

The signature contains the clauses, derogations, and dispensations, with which the pope grants the favour, or the benefice, with a commission for the execution of it, either in forma dignum, or in gracious form.

A signature of the pope's own hand, by which he answers, *Fiat ut petitur*, is preferred to another answered by the prelate, in his presence, in these words, *Concessum uti petitur in presentia D. N. pape*. Sometimes in signatures, with the *fiat*, the pope adds, *proprio motu*; which clause gives them still farther force.

There are three kinds of signatures: one in *forma gratiosa*, dispatched on an attestation of the ordinary; another in *forma dignum antiqua*, dispatched for canonicates; the third in *forma dignum novissima*, which is a kind of second signature, or executorial letter, granted where, upon the ordinary's failing to execute the first, within thirty days, the nearest other ordinary is enjoined to execute it.

SIGNATURE, in *Printing*, denotes a mark at the bottom of each sheet, to regulate the gathering and binding of the book; and to shew the order and number of the sheets, in collating, to see if the book is perfect.

The signatures consist of the capital letters of the alphabet. If there be more sheets than letters in the alphabet, to the capital letter they add a small one of the same sort; *i. e.* a little a after a great A, &c. which they repeat as often as is necessary.

SIGNATURE, *Signatura*, is also used, by some naturalists, for the resemblance a vegetable or mineral bears to any part of the human body; this is, by some fantastical people,

people, supposed to afford an indication of its virtues and use.

SIGNAU, in *Geography*, a town of Switzerland, and principal place of a district, in the canton of Berne; 12 miles S.E. of Berne.

SIGNES, a town of France, in the department of the Var; 12 miles S.W. of Brignoles.

SIGNET, one of the king's seals, used for sealing his private letters, and signing all grants which pass his majesty's hand by bill. Forging it is treason. See **SIGN Manual**.

The signet is always in the custody of the king's secretaries; on whom attend four clerks of the signet-office. See **SECRETARY** and **CLERK**.

SIGNIA, in *Ancient Geography*, a town of Italy, in Latium, at some distance to the right of the Latin way, and towards the S.W. of Anagnia. Livy says, that Tarquin the Proud sent thither a colony. Some remains of it are still visible.—Also, a mountain of Asia Minor, in the Greater Phrygia. Pliny says, that the town of Apamæa was built at the foot of this mountain.

SIGNIFER, among the Romans, an ensign-bearer, or the person who carries the standard, on which was represented a hand stretched out. See **SIGNA**.

SIGNIFICATION, the sense or meaning of a sign, word, phrase, emblem, device, or the like; that is, the thing denoted by such sign, word, figure, &c.

We are almost perfectly at a loss as to the signification of the hieroglyphic characters of the ancients.

SIGNIFICATION, in *Law*, is the notification of an act, &c. made to the opposite party, by a copy, &c. of it, given and attested by a proper officer.

Some significations are to be made to the person himself; or at least at his house: for others, it is enough that they be made to the party's attorney, or agent.

SIGNIFICAVIT. See **EXCOMMUNICATO Capiendo**.

SIGNING. See **SIGNATURE**, and **COUNTER-signing**.

SIGNINUM, among the Romans, a kind of pavement much esteemed: it was made of powdered shells mixed with lime.

SIGNORELLI, LUCA, in *Biography*, was born at Cortona in 1439, and was a disciple of Pietro della Francesca. He was among the first of the Italian artists who designed the naked figure with fidelity and accuracy; though still impeded by the shackles of stiffness and formality, and too much adherence to common nature. His greatest work is his celebrated fresco in the chapel of the Virgin in the cathedral at Orvieto, representing the final dissolution and judgment of the world; a work of extraordinary quality, in which variety and originality of ideas are rendered with force and effect. Vafari, who was related to Signorelli, says that Michael Angelo adopted, in his Last Judgment, many of the ideas of this artist; of which most probably he only took the characters of actions, and clothed them with his own emphatic style of design.

Though grace of form, and harmony of colouring, are not the most prominent features in the style of Signorelli, yet one of his works is extolled by Lanzi as possessing these qualities in a superior degree; viz. his Communion of the Apostles, in the church del Gefa at Cortona. He was invited to Rome to assist in decorating the apartments of the Sistine, where he painted the Journey of Moses and Zipporah, and the Promulgation of the old Law; exhibiting a superior arrangement of composition. He painted at Urbino, Volterra, Arezzo, Sienna, and Florence, and established a name among the most eminent of the Florentine painters. He died in 1521, aged 82.

VOL. XXXII.

SIGNORELLI, PIETRO NAPOLI, of Naples, author of an excellent critical history of the stage, "*Storia Critica de' Teatri*," 1783. This work is written with great spirit, and, in general, exactitude and genuine information, concerning other theatres, as well as those of Italy; particularly of Spain, where the author had resided twenty years, and with whose literature and dramatic productions he seems perfectly well acquainted. But having given the preference to the dramatic works and performance of the Italians, he provoked a controversy with a Spanish writer, which was not carried on with great patience or urbanity.

Signorelli is likewise author of a work more voluminous and important, entitled "*Vicende della Coltura nelle due Sicilie*;" or, "*Progress in the Culture of Legislation, Policy, Literature, Commerce, Fine Arts, and Theatrical Exhibitions, in the Two Sicilies*," 5 vols. 8vo. Naples, 1786. This work contains much information of the progress of music at Naples during the two last centuries; but we were disappointed in finding no mention of the Conservatorios, those famous musical seminaries which have produced so many great composers and singers, whose works and performance have not only delighted Naples and the rest of Italy, but all Europe.

SIGNORESSA, in *Geography*, a town of Italy, in the Trevifan; 6 miles N.W. of Treviso.

SIGNUM PUGNÆ, the signal of battle among the Romans, was a coat of arms of a purple colour, set upon the general's pavilion.

SIGNY-le-Grand, in *Geography*, a town of France, in the department of the Ardennes, and chief place of a canton, in the district of Mezieres; 6 miles S.W. of Charleville. The place contains 2380, and the canton 6699 inhabitants, on a territory of 210 kilometres, in 13 communes.

SIGNY-le-Petit, a town of France, in the department of the Ardennes, and chief place of a canton, in the district of Rocroy; 9 miles W.S.W. of Rocroy. The place contains 1723, and the canton 5790 inhabitants, on a territory of 142½ kilometres, in 10 communes.

SIGONIO, CARLO, in *Biography*, was born of a good family at Modena, about the year 1524. At the age of seventeen he went to Bologna, where he passed three years in the study of philosophy and medicine, to which last profession he was destined by his father. But having no turn for physic, he spent a year at Pavia, and then entered into the service of cardinal Grimani. At the age of twenty-two he was taken by invitation from his native city to occupy the chair of Greek, vacant by the departure of Porta, the master under whom he had formerly studied. In 1550 he made himself advantageously known to the learned world by publishing the "*Facti Consulares*," with a commentary, which quickly went through several editions. In 1552 he was invited to the professorship of belles-lettres at Venice, and in that city he published seven discourses on important topics of literature, and his valuable notes and conjectural emendations of Livy. In 1560 he was removed to the chair of eloquence at Padua, then the most celebrated of the Italian universities, but in 1563 he accepted an invitation to Bologna, which was from this time the usual place of his residence. In this situation he rendered himself so acceptable to the city, that he was presented with its freedom, together with a large increase of salary. Here he employed himself in the composition of learned works, which have handed down his name to posterity with high honour, and he was so well satisfied with his condition, that he refused a very flattering proposal from Stephen, king of Poland, to occupy a professorship in that country.

country. He visited Rome in 1578, where he was honourably received by pope Gregory XIII., by whom he was engaged to compose an ecclesiastical history. Of this, however, he executed no more than some learned illustrations of Sulpicius Severus; for he died at Modena in the year 1584. He was a most able and successful elucidator of ancient history and antiquities. He was indefatigable in searching to the bottom all subjects which he undertook to examine, so that in many he left little to be added by later enquirers, and his works are all carefully composed in a pure, and even an elegant, Latin style. Besides the pieces already mentioned, he published many valuable tracts on the Roman laws and customs, also on the republics of the Hebrews, Athenians, and Lacedæmonians. He composed twenty books of a history relating to the western empire, from the time of Dioclesian to its final destruction, and he performed the more arduous task of framing from the rude and obscure chronicles of the times, a history of the kingdom of Italy, from the arrival of the Lombards to the year 1286. Sigonio was involved in several controversies, in one of which he is supposed to have disgraced himself. About twelve months before he died, an intimate friend of his edited a pretended treatise of Cicero, entitled "Confolatio." Its authenticity was immediately impugned by critics, and there is now no doubt that it was not genuine; but Sigonio wrote so warmly in defence of it, that he is generally supposed to be the author. The works of this learned man were published collectively in 1732-3, by Argelati, at Milan, in six vols. fol. with his Life, by Muratori, prefixed.

SIGORUM, in *Ancient Geography*, a mountain of Asia, in Mesopotamia, in the vicinity of the town of Nisibis, according to Sozomen.

SIGOULES, **LE**, in *Geography*, a town of France, in the department of the Dordogne; 7 miles S. of Bergerac.

SIGRI, a town on the N.W. part of the island of Metelin, in the Grecian Archipelago.

SIGRIANA, in *Ancient Geography*, a country of Asia, in Media, according to Strabo.

SIGRIANI, mountains of Asia Minor, on the coast of the Propontide.

SIGRIUM, a promontory of the isle of Lesbos, in the most westerly part of the island.

SIGRUM, a port of the isle of Tenedos, in which was a statue of Diana.

SIGTUNA, in *Geography*, a town of Sweden, in the province of Upland, situated on a creek of the Malar lake, anciently one of the chief cities of the kingdom. It is said to derive its name from the celebrated Odin, whose surname was Sigge: he came into the north before the Christian era, and had his residence, his temple, and his court of justice; others say the town was built by Odin. However that be, Sigtuna has undergone many changes; in the year 1008, it was plundered and burnt by Olof the Pious, king of Norway; in 1188, it was destroyed by the Carelians, Estonians, and Russians. It recovered from these calamities, and flourished till the vast increase of Stockholm gave it a blow, which it is not likely to recover; 10 miles N. of Stockholm.

SIGUA, in *Ancient Geography*, a town of Asia, in the Greater Armenia. Ptolemy.

SIGUENÇA, in *Geography*, a city of Spain, in Old Castile, situated on the edge of a mountain, near the source of the river Henares; the see of a bishop, suffragan of Toledo, with an university, founded in the year 1441, by cardinal Ximenes. It contains three churches, three convents, two hospitals, a strong castle, an arsenal, and be-

tween 700 and 800 houses. This town was anciently called Segontia. A battle was fought here between Pompey and Sertorius; and in the beginning of the seventh century, the Goths were defeated here by the Romans; 56 miles N.E. of Madrid. N. lat. 40° 58'. W. long. 2° 57'.

SIGUETTE, in the *Manège*, is a cavesson of iron, with teeth or notches, that is, a semicircle of hollow and vaulted iron, with teeth like a saw, consisting of two or three pieces joined with hinges, and mounted with a head-stall and two ropes, as if they were the cavessons that in former times were wont to be put upon the nose of a fiery stiff-headed horse, in order to keep him in subjection.

There is a sort of figuette, that is, a round iron all of one piece, sewed under the nose-band of the bridle, that it may not be in view. This figuette we employ with a martingale, when a horse beats upon the hand.

SIHASTRIA, in *Geography*, a town of Moldavia; 34 miles W. of Suczava.

SIHAUL, a town on the W. coast of Sumatra. N. lat. 0° 23'. E. long. 119° 45'.

SI-HIAM, a town of China, of the third rank, in Chen-fi; 37 miles E.S.E. of Han-tchong.

SI-HO, a town of China, of the third rank, in Chen-fi; 42 miles W. of Oei.

SI-HOA, a town of China, of the third rank, in Ho-nan; 32 miles E.S.E. of Hiu.

SIHON, or **GIHON**, or *Amu*. See **JIHON** and **AMU**.

SIHON, or *Sharokie*, a name given to the river Sirr, in its course.

SIHOR, a town of Hindoostan, in Guzerat; 25 miles W. of Gogo.

SIHUTLA, a town of Mexico, in the province of Mechoacan; 25 miles W. of Zacatula. N. lat. 18° 45'. W. long. 103° 26'.

SIKAJOCKI, a town of Sweden, in East Bothnia; 8 miles N. of Brahestad.

SIKE, in *Rural Economy*, a term provincially applied to a little rill, a water-furrow, and a gutter.

SIKEVI, in *Geography*, a town of Turkish Circassia, on the coast of the Black sea; 30 miles S.E. of Anapa.

SIKFORD, a town of Sweden, in West Bothnia; 18 miles N.W. of Pitea.

SIKHS, or **SEIKS**, an appellation formed of the Sanscrit term *Sikh*, or *Sicsha*, denoting a disciple or devoted follower, and in the Panjabi corrupted into *Sikh*, which is applicable to any person that follows a particular teacher; and hence used to denominate, in its primary use, a religious sect, which advanced, by successive gradations, from the humble condition of religionists, to the rank of one of the most powerful states in Hindoostan. The founder of this sect was Nanac Shah, a native of a small village called Talwandi, in the district of Bhatti, in the province of Lahore, where he was born A.D. 1469. It is now become a town, and denominated Rayapour, and is situated on the banks of the Beyah or Hyphasis. Nanac's father, whose name was Calû, and who belonged to the Chatriya cast and Védi tribe of Hindoos, wished to bring him up to trade, but Nanac himself was from his childhood inclined to devotion, and manifested an indifference to all worldly concerns. This disposition was cherished by his intercourse with the Fakirs, among whom and the poor he distributed a great part of his substance. It is needless to recite his trances and visions, and converse with the prophet Elias, and the austerities which he practised at the commencement and in the progress of his religious career. Nor can we accompany him in his travels which he undertook with a view of reforming the worship of the

the true God, that had been degraded by the idolatry of the Hindoos and the ignorance of the Mahometans. It will be sufficient for us to observe, that after he had visited all the cities of India, and explained to all ranks the great doctrines of the unity and omnipresence of God, he went to Mecca and Medina, where his actions, his miracles, and his long disputations with the Mahometan saints and doctors, are most circumstantially recorded by his biographers. He is stated, on this occasion, to have defended his own principles without offending those of others; always professing himself the enemy of discord, and as having no object but to reconcile the two faiths of the Mahometans and Hindoos in one religion; which he endeavoured to do by recalling them to that great and original tenet, which both of them believed, the unity of God; and by reclaiming them from the numerous errors into which they had fallen. During his travels, about the year 1526 or 1527, Nanac was introduced to the emperor Baber, before whom he is said to have maintained his doctrine with great firmness and eloquence. Baber treated him kindly, and offered him an ample maintenance, which the Sikh priest refused, alleging, that he trusted in him who provided for all men, and from whom alone a man of virtue and religion would consent to receive favour or reward. The Hindoo zealots violently opposed him, more especially after he had laid aside the habits of a Fakir; but he treated their opposition and reproaches with great contempt; and when they required him to exhibit some proof of his power, that might astonish them, he replied, "I have nothing to exhibit worthy of you to behold. A holy teacher has no defence but the purity of his doctrine; the world may change but the creator is unchangeable." Having migrated from Vatala to Multan, and from Multan to Kirtipur, on the banks of the Ravee or Hydraotis, he there performed many miracles, as it is reported, threw off his earthly shape, and was buried near the bank of the river Ravee, which has since overflowed his tomb. Kirtipur continues to be a place of religious resort and worship; and a small piece of Nanac's garment is exhibited to pilgrims, as a sacred relic, at his Dharmasala, or temple. Nanac was unquestionably a man of more than common genius, which we may infer from the distinguished eminence to which he attained, and the success with which he combatted the opposition that encountered him; whilst he laboured without intermission to recall both Mahometans and Hindoos to an exclusive attention to that sublimest of all principles, which inculcates devotion to God and peace towards men. Although he left two sons, he did not deem either of them worthy of a succession to his spiritual functions; but he devolved them upon a Chhatriya of the Trehun tribe, called Lehana, whom he had initiated in the sacred mysteries of his sect, clothed in the holy mantle of a Fakir, and honoured with the name of Angad. Guru Angad was born at the village of Khandur, on the bank of the Beyah or Hyphaasis, in the province of Lahore. He taught the same doctrine as Nanac; and some of his writings, as well as those of Nanac, are contained in a book entitled "Grant'h." At his death, which happened A.D. 1552, he was succeeded by Amera Das, a Chhatriya of the tribe of B'halé, who had been a menial servant for twelve years. Amera Das was active in propagating the tenets of Nanac and successful in gaining proselytes, by whose assistance he established a degree of temporal power. He had two sons, and a daughter, named B'haini, who was married to a young lad, whose name was Ram Das, a Chhatriya, of a respectable family, of the Sondi tribe, and an inhabitant of the village of Gondawal. Upon the death of Amera Das, A.D. 1574, he was succeeded by his son-in-law, whom he had initiated in the mysteries of his holy profession, and who became famous

for his piety, and still more on account of the improvements he made at Amritsar, which was for some time called Ramapur, or Ramdasapur, after him. Some writers have erroneously ascribed the foundation of this town, anciently and long before his time denominated Chak, to him; however, he added much to its population, and built a famous tank, or reservoir of water, which he called Amritsar, a name signifying the water of immortality, and which has become so sacred, that it has given its name, and imparted its sanctity, to the town of Ramdasapur; so that it has become the sacred city of the Sikh nation, and is now only known by the name of Amritsar. After a life passed in the undisturbed propagation of his tenets, in explanation of which he wrote several books, Ram Das died A.D. 1581, and left two sons, one of whom, viz. Arjunmal, succeeded him, and rendered himself famous by compiling the A'di-Grant'h, containing ninety-two sections, part of which was composed by Nanac and his immediate successors, but arranged in its present form by Arjunmal, who blended his own additions with the compositions of his predecessors. Arjun, from this circumstance, is deemed the first who gave consistent form and order to the religion of the Sikhs. Arjun fell a sacrifice to the jealousy of the Mahometan government; and his death excited the indignation of the Sikhs, who, before this event, had been an inoffensive, peaceable sect; and they took up arms under Har Govind, the son of Arjunmal, and wreaked their vengeance upon all whom they thought concerned in the murder of their revered priest. From all the remaining accounts of Har Govind's life, it appears to have been his anxious wish to inspire his followers with the most irreconcilable hatred of their oppressors. Govind, with this view, introduced some change in their diet, allowing them to eat the flesh of animals, that of the cow excepted; and by other regulations converted a race of peaceable enthusiasts into an intrepid band of soldiers. Govind died A.D. 1644, and was succeeded by his grandson Har Ray, whose reign was upon the whole tranquil, which was probably owing to the vigour of the Mahometan power in the early part of the reign of Aurungzebe. At his death, A.D. 1661, a violent contest arose among the Sikhs, concerning the succession to the office of spiritual leader; for the temporal power of their ruler was, at this time, little more than nominal. The dispute was referred for decision to Delhi; and by an imperial decree of Aurungzebe, the Sikhs were allowed to elect their own priest. They chose Har Krishn, son (or grandson) of Har Ray, who died at Delhi A.D. 1664, and was succeeded by his uncle, Tegh Behadur. During his life, which terminated prematurely, by the violence of his rival, A.D. 1675, and also from the period of Govind's death, the Mogul empire was in the zenith of its power under Aurungzebe; and the Sikhs, who had never attained any real strength, were rendered still weaker by their own dissensions. However, after the death of Tegh Behadur, the history of the Sikhs assumed a new aspect. Under Har Govind the Sikhs had been initiated in arms, but they used them only in self-defence; but the plans of Govind's ambition were very different from those of his predecessor Nanac; and he wisely judged, that the only means by which he could ever hope to oppose the Mahometan government with success, were not only to admit converts from all tribes, but to break at once those rules by which the Hindoos had been so long chained;—to arm, in short, the whole population of the country, and to make worldly wealth and rank an object to which Hindoos, of every class, might aspire. It was the object of Govind to make all Sikhs equal, and that their advancement should solely depend upon their exertions; and well aware how necessary it was to inspire men of a low race,

and of grovelling minds, with pride in themselves, he changed the name of his followers from Sikh to Sinh or lion; thus giving to all his followers that honourable title which had been before exclusively assumed by the Rajaputs, the first military class of Hindoos; and every Sikh felt himself at once elevated, by this proud appellation, to a footing with the first class. The disciples of Govind were required to devote themselves to arms; always to have steel about them in one shape or other; to wear a blue dress; to allow their hair to grow; and to exclaim, when they met each other, "Wa! Guruji ka khalfat! Wa! Guruji ki futteh!" *i. e.* Success to the state of the Guru! Victory attend the Guru! Guru Govind inculcated his tenets upon his followers by his preaching, his actions, and his works. He is said to have first instituted the Guru-mata, or state council, among the Sikhs, which meet at Amritsar; by which institution he gave that form of a federative republic to the commonwealth of the Sikhs, which was most calculated to rouse his followers from their indolent habits, and deep-rooted prejudices, by assigning to them a personal share in the government, and placing within the reach of every individual, the attainment of rank and influence in the state. The emperor Aurungzebe, aided by the rajas who were hostile to Govind, pursued him and his followers to Chamkour, and encompassed it on all sides. The siege was carried on with great vigour; and though Govind manifested an invincible spirit, and performed prodigies of valour, he was at last overpowered by numbers; and reduced to the necessity of making his escape from Chamkour in a dark night, covering his face, as it is said, from shame at his own disgrace. After his flight, a sense of his misfortunes, and the loss of his children, deprived him of his reason, and he wandered about for a considerable time in the most deplorable condition. At length, having obtained from the emperor Behadur Shah a small military command in the Deccan, he was stabbed by a Patan soldier's son, and expired of his wounds, A.D. 1708, at Naded, a town situated on the Caveri river, about 100 miles from Haiderabad. Guru Govind was the last acknowledged religious ruler of the Sikhs. A prophecy had limited their spiritual guides to the number of ten; and their superstition, aided, without doubt, by the action of that spirit of independence which his institutions had introduced, caused its fulfilment. Banda, a devoted follower and friend of Guru Govind, established the union of the Sikhs under his banners; and his grief at the misfortune of his priest, is said to have settled after the death of Govind into a gloomy and desperate desire to avenge his wrongs. The confusion which took place on the death of Aurungzebe, which happened A.D. 1707, was favourable to his wishes. Having obtained a victory over the Mahometans in a bloody action, Banda, encouraging the Sikhs, and hardening them by his lessons to deeds of the most horrid atrocity, subdued all the country between the Setlej and the Jumna, and crossing that river, made inroads into the province of Sharanpour, which lies a few miles to the N.E. of Delhi, between the rivers Jumna and the Ganges. The march of the Sikhs was attended with the exercise of the most wanton barbarity; life was only granted to those who conformed to the religion, and adopted the habits and dress of the Sikhs; and if Behadur Shah had not quitted the Deccan, which he did A.D. 1710, the whole of Hindoostan would probably have been subdued by these merciless invaders. The first check which the Sikhs received was from an army under sultan Kuli Khan. They were afterwards defeated in a very desperate action by Abdal Samad Khan, an officer of the emperor Farakheir, after which the Sikhs were never able to make a stand, but were hunted like wild beasts from one strong hold to another,

by the army of the emperor, by whom their leader, Banda, and his most devoted followers, were at last taken, after having suffered every extreme of hunger and fatigue. Great numbers of the Sikhs were put to death, after the surrender of Lohgad', a fortress 100 miles N.E. of Lahore; but Banda was sent, with the principal chiefs of the tribe, to Delhi, where, after having been treated with every kind of obloquy and insult, they were executed.

After the defeat and death of Banda, resentment prompted to every measure that could be devised, not only to destroy the power, but to extirpate the race of the Sikhs. From the Mahometans they met with no quarter; and after the execution of their chief, a royal edict was issued, ordering all who professed the religion of Nanac to be taken and put to death wherever found; and by way of giving greater effect to this mandate, a reward was offered for the head of every Sikh. During the interval that elapsed between the defeat and death of Banda, and the invasion of India by Nadir Shah, a period of nearly 30 years, we hear nothing of the Sikhs; but when that event occurred, they are said to have fallen upon the inhabitants of the Panjab, who sought shelter in the hills, and to have plundered them of that property which they were endeavouring to secure from the rapacity of the Persian invader. Enriched with these spoils, says the author whose account of them we are now citing, the Sikhs left the hills, and built the fort of Dalewal, on the Ravi, from whence they made predatory incursions, and are stated to have added, both to their wealth and reputation, by harassing and plundering the rear of Nadir Shah's army, which, when it returned to Persia, was encumbered with spoil, and marched, from a contempt of its enemies, with a disregard to all order.

The weak state to which the empire of Hindoostan was reduced, and the confusion into which the provinces of Lahore and Cabul were thrown, by the death of Nadir, were events of too favourable a nature to the Sikhs to be neglected by that race, who became daily more bold, from their numbers being greatly increased by the union of all those who had taken shelter in the mountains; the re-admission into the sect of those who, to save their lives, had abjured, for a period, their usages; and the conversion of a number of profelytes, who hastened to join a standard under which robbery was made sacred, and to plunder was to be pious.

Aided with these recruits, the Sikhs now extended their irruptions over most of the provinces of the Panjab; and though it was some time before they repossessed themselves of Amritsar, they began, immediately after they quitted their fastnesses, to flock to that holy city at the periods of their sacred feasts. Some performed this pilgrimage in secret, and in disguise; but in general, according to a contemporary Mahometan author, the Sikh horsemen were seen riding, at full gallop, towards "their favourite shrine of devotion. They were often slain in making this attempt, and sometimes taken prisoners; but they used, on such occasions, to seek, instead of avoiding, the crown of martyrdom;" and the same authority states, "that an instance was never known of a Sikh, taken in his way to Amritsar, consenting to abjure his faith."

Encouraged by the confusion which took place on the first Afghan invasion, A.D. 1746, the Sikhs made themselves masters of a considerable part of the Doab of Ravi and Jalandra, and the country between the rivers Ravi and Beyah, and that river and the Setlej, and extended their incursions to the neighbouring countries. But though they were severely and repeatedly checked by Mir Manu, the governor of Lahore, yet, after his death, they availed themselves of all the advantages which the local distractions of a falling empire

pire afforded them of extending and establishing their power. Their bands, under their most active leaders, plundered in every direction, and were successful in obtaining possession of several countries, from which they have never since been expelled; and their success, at this period, was promoted, instead of being checked, by the appointment of their old friend, Adina Beg Khan, to Lahore; as that brave chief, anxious to defend his own government against the Afghans, immediately entered into a confederacy with the Sikhs, whom he encouraged to plunder the territories of Ahmed Shah Abdali.

The Afghan monarch, resenting this predatory warfare, in which the governor of Lahore was supported by the court of Delhi, determined upon invading India. Adina Beg, unable to oppose him, fled: and the Sikhs could only venture to plunder the baggage, and cut off the stragglers of the Afghan army, by which they so irritated Ahmed Shah, that he threatened them with punishment on his return; and when he marched to Cabul, he left his son Taimur Khan, and his vizir, Jehan-Khan, at Lahore, with orders to take vengeance on the Sikhs for all the excesses which they had committed. The first expedition of Taimur Khan was against their capital, Amritsar, which he destroyed, filling up their sacred tank, and polluting all their places of worship; by which action he provoked the whole race to such a degree, that they all assembled at Lahore, and not only attempted to cut off the communication between the fort and country, but collected and divided the revenues of the towns and villages around it. Taimur Khan, enraged at this presumption, made several attacks upon them, but was constantly defeated; and, being at last reduced to the necessity of evacuating Lahore, and retreating to Cabul, the Sikhs, under one of their celebrated leaders, called Jassa Singh Calal, immediately took possession of the vacant foubah of Lahore, and ordered rupees to be coined, with an impression to the following import: "Coined by the grace of Khalfah ji, in the country of Ahmed, conquered by Jassa Singh Calal." Although they were afterwards expelled, together with the Afghans, from Lahore, yet after the death of Adina Beg Khan, the governor of this province, they eagerly seized the opportunity that was thus afforded them, of making themselves again masters of Lahore. Their success was, however, soon checked by Ahmed Shah Abdali, who, irritated by their unsubdued turbulence and obstinate intrepidity, made every effort (after he had gained the victory of Panipat, which established his supremacy at Delhi) to destroy their power; and, with this view, he entered the Panjab early in 1762, and over-ran the whole of that country with a numerous army, defeating and dispersing the Sikhs in every direction. That sect, unable to make any stand against the army of the Abdali, pursued their old plan of retreating near the mountains; and collected a large force in the northern districts of Sirhind, a distance of above one hundred miles from Lahore, where the army of Ahmed Shah was encamped. Here they conceived themselves to be in perfect safety; but that prince made one of those rapid movements for which he was so celebrated, and reaching the Sikh army on the second day, completely surprised and defeated it with great slaughter. In this action, which was fought in February 1762, the Sikhs are said to have lost upwards of twenty thousand men; and the remainder fled into the hills, abandoning all the lower countries to the Afghans, who committed every ravage that a barbarous and savage enemy could devise. Amritsar was razed to the ground, and the sacred reservoir again choked with its ruins. Pyramids were erected, and covered with the heads of slaughtered Sikhs; and it is mentioned that Ahmed Shah caused

the walls of those mosques which the Sikhs had polluted to be washed with their blood, that the contamination might be removed, and the insult offered to the religion of Mohamet expiated.

This species of savage retaliation appears to have animated instead of depressing the courage of the Sikhs, who, though they could not venture to meet Ahmed Shah's army in action, harassed it with an incessant predatory warfare; and when that sovereign was obliged, by the commotions of Afghanistan, to return to Cabul, they attacked and defeated the general he had left in Lahore, and made themselves masters of that city, in which they levelled with the ground those mosques which the Afghans had, a few months before, purified with the blood of their brethren.

When Ahmed Shah, after retaking Lahore, A.D. 1763, was obliged, in the ensuing year, to return to his own country, the Sikhs again expelled his garrison, and made themselves masters of the Panjab; and, from that period until his death, a constant war was maintained, in which the enterprise and courage of the Afghans gradually gave way before the astonishing activity, and invincible perseverance, of their enemies; who, if unable to stand a general action, retreated to impenetrable mountains, and the moment they saw an advantage, rushed again into the plains with renewed vigour and recruited numbers. Several Sikh authors, treating of the events of this period, mention a great action having been fought by their countrymen, near Amritsar, against the whole Afghan army, commanded by Ahmed Shah in person; but they differ with regard to the date of this battle, some fixing it in 1762, and others later. They pretend that the Sikhs, inspired by the sacredness of the ground on which this action was fought, contended for victory against superior numbers with the most desperate fury, and that the battle terminated in both parties quitting the field, without either being able to claim the least advantage. The historians of Ahmed Shah are, however, silent regarding this action, which indeed, from all the events of his long contests with the Sikhs, appears unlikely to have occurred. It is possible the Sikhs fought at Amritsar with a division of the Afghan army, and that might have been commanded by the prince; but it is very improbable they had ever force to encounter the concentrated army of the Abdalis, before which, while it remained in a body, they appear, from the first to the last of their contests with that prince, to have always retreated, or rather fled.

The Sikhs, when oppressed, became as formidable for their union, as for their determined courage and unconquerable spirit of resistance: but a state of persecution and distress was most favourable for a constitution like theirs, which required constant and great sacrifices of personal advantage to the public good: and such sacrifices can only be expected from men who act under the influence of that enthusiasm, which the fervour of a new religion, or a struggle for independence, only imparts, and which are always most readily made when it becomes obvious to all, that a complete union in the general cause is the only hope of individual safety.

The Sikhs may be reckoned the most western nation of Hindoostan: for the king of Candahar possesses but an inconsiderable extent of territory on the east of the Indus. Since the complete downfall of the Mogul empire, they have acquired very extensive domains. But major Rennell observes, that their power ought not to be estimated in the exact proportion to the extent of their population, since they do not form one entire state; but a number of small ones, independent of each other in their internal government, and only connected by a federal union. They have extended their territories on the south-east, that is, into the province

of Delhi, very rapidly of late years; and perhaps, the Zemindars of that country may have found it convenient to place themselves under the protection of the Sikhs, in order to avoid the more oppressive government of their former masters. It is certain that the eastern boundary of the Sikhs' dominions has been advanced to the banks of the Jumna river, above Delhi, and to the neighbourhood of that city; for the adjoining territory of Schauranpour is subject to their depredations, if not actually tributary to them; and they make incursions even to the side of the Ganges. On the south, they are bounded by the northern extreme of the sandy desert of Registan, and on the south-west their boundary meets that of Sindy, or Tatta, at the city of Behker or Bhekr, on the Indus. On the west the Indus is their general boundary, as high up as the city of Attock; near to which begin the territories of the king of Candahar; and their northern boundary is the chain of mountains that lies towards Thibet and Cashmere. As this is the case, they will be found to possess the whole soubah or province of Lahore, the principal part of Moultan, and the western part of Delhi; the dimensions of which tract are about 400 British miles from N.W. to S.E., and from 150 to 200 broad, in general; although in the part between Attock and Behker (that is, along the Indus) the extent cannot be less than 320. Their capital city is Lahore.

According to the statement of brigadier-general Malcolm, the country now possessed by the Sikhs, which reaches from N. lat. $28^{\circ} 40'$ to beyond N. lat. 32° , and includes all the Panjab, a small part of Moultan, and most of that tract of country which lies between the Jumna and the Setlej, is bounded, to the northward and westward, by the territories of the king of Cabul; to the eastward, by the possessions of the mountaineer rajas of Jammu, Nadon, and Srinagar; and to the southward, by the territories of the English government, and the sandy deserts of Jafalmer and Hanfya Hissar. A general estimate of the value of the country possessed by the Sikhs may be formed, when it is stated, that it contains, besides other countries, the whole of the province of Lahore; which, according to Mr. Bernier, produced in the reign of Aurungzebe, 246 lacks and 95,000 rupees; or 2,469,500*l.* sterling. The Sikhs who inhabit the country between the Setlej and the Jumna, are called Malawa Sinh, and were almost all converted from the Hindoo tribes of Jats and Gujars. The country of the Malwa Sinh is in some parts fruitful; but those districts which border on Hanfya and Carnal are very barren; being covered with low wood, and in many places almost destitute of water. Its former capital was Sirhind, but it is now a complete ruin. Patiala is now the largest and most flourishing town of this province, and next to it is T'hanefur, which is still held in high veneration by the Hindoos, who have also a high reverence for the river Serafweti, which flows through this province. The country of Jalendra Dooab, which reaches from the mountains to the junction of the Setlej and the Beah, is the most fruitful of all the possessions of the Sikhs, and is perhaps excelled, in climate and vegetation, by no province in India. The soil is light, but very productive; the country, which is open and level, abounds in every kind of grain. The towns of Jalendra and Sultanpour are the principal in the Dooab. The country between the Beyah and Ravi rivers is called Bari Dooab, or Manj'ha; and the Sikhs inhabiting it are called Manj'ha Sinh. The cities of Lahore and Amritsar are both in this province, and consequently it becomes the great centre of the power of this nation. The country of Bari is said to be less fertile, particularly towards the mountains, than Jalendra, but lying on the same level, its climate and soil must be nearly the same.

The inhabitants of the country between Ravi and Chanhab are called D'harpi Sinh, from D'harpi, the name of the country: the D'hanigheb Sinh are beyond the Chanhab, but within the Jehalam river. The Sind Sinh is the term by which the inhabitants of the districts under the Sikhs bordering on the Sind are known; and Nakai Sinh is the name given to the Sikhs who reside in Moultan.

The government of the Sikhs may be termed a theocracy. Although they obey a temporal chief, that chief preserves his power and authority by professing himself the servant of the khalsa, or government, which can only be said to act, in times of great public emergency, through the means of a national council, of which every chief is a member, and which is supposed to deliberate and resolve under the immediate inspiration and impulse of an invisible being; who, as they believe, always watches over the interests of the commonwealth. It is natural, however, to imagine that the power of this assembly should decline; and from Col. Malcolm's account, we may infer, that it is nearly destroyed. The last Guru-mata was called in 1805, when the British army pursued Holkar into the Panjab. The government is mild; but in their mode of making war the Sikhs are unquestionably savage and cruel. Among the Sikhs there is a class of devotees, called Acalis, or immortals, who, under the double character of fanatic priests and desperate soldiers, have usurped the sole direction of all religious affairs at Amritsar; and who, of course, are leading men in a national council held at that sacred place, and which deliberates under all the influence of religious enthusiasm. This order of Sikhs was first founded by Guru Govind, and are distinguished by their dress, as well as by their having almost the sole direction of the religious ceremonies at Amritsar. They have a place on the bank of the sacred reservoir of Amritsar, where they generally resort, but are individually possessed of property, though they affect poverty, and subsist on charity. The principal chiefs of the Sikhs are all descended from Hindoo tribes. The lower order of Sikhs, compared with the wretched Mahometans who are doomed to oppression and hard labour, are happy; they are protected from the tyranny and violence of the chiefs under whom they live by the precepts of their common religion, and by the condition of their country, which enables them to abandon, whenever they chuse, a leader whom they dislike. The civil officers, to whom the chiefs entrust their accounts, and the management of their property and revenue concerns, as well as the conduct of their negotiations, were in general Sikhs of the Khalafa cast, who, being followers of Nanae, and not of Guru Govind, are not devoted to arms, but educated for peaceful occupations, in which they often become very expert and intelligent. In the collection of the revenue of the Panjab, it is said to be a general rule, that the chiefs to whom the territories belong should receive the half of the produce, grain paying in kind, but sugar, melons, &c. in cash, and the farmer the other: but the chief never levies the whole of his share; and in no country, perhaps, is the ryat, or cultivator, treated with more indulgence. Commerce is rather restrained than encouraged by the heavy duties and the distracted state of the country. However, a great part of the shawl trade now flows through the cities of Lahore, Amritsar, and Patiala, to Hindoostan. The administration of justice among the Sikhs is in a very rude and imperfect state.

Their law is all unwritten. Nothing is consigned to any express form of words. There is no definition of any thing. The custom of the country, the custom of the court, (that is to say, as far as the judge is pleased to be governed by those customs), and the will of the judge,—are the

the circumstances which guide the decision. Among the Hindoos some of the sacred books, among the Mahometans the Koran, are used as the books of law. Among the Sikhs there is no such reference to any sacred books; and their situation is, in all probability, so much the better: for the Koran or Hindoo books afford scarcely any rules or principles of law, which are not so vague as to speak any language which the interpreter chuses to give them; and while their authority is sufficient to supersede that of the natural dictates of justice and equity, which are the only guides of the Sikh judges, the Hindoo or Mahometan has only to find or to feign a principle of his book, which may enable him to decide as he pleases.

Trifling disputes about property are settled by the heads of the village, by arbitration, or by the chiefs. The court of arbitration is called *panchayat*, or a court of five, the general number of arbitrators chosen to adjust differences and disputes. It is usual to assemble a *panchayat*, or a court of arbitration, in every part of India under a native government; and, as they are always chosen from men of the best reputation in the place where they meet, this court has a high character for justice. The decision obtained by either of these modes is final. If a theft occurs, the property is recovered, and the party punished, not with death, by the person from whom it was stolen, or by the inhabitants of the village, or his chief. Murder is sometimes punished by the chief; but more generally by the relatives of the deceased, who, in such cases, rigorously retaliate on the murderer, and sometimes on all who endeavour to protect him.

The character of the Sikhs, or rather Sinhs, which is the name by which the followers of Guru Govind, who are all devoted to arms, are distinguished, is very marked. They have, in general, the Hindoo cast of countenance, somewhat altered by their long beards, and are to the full as active as the Mahrattas, and much more robust, from their living fuller, and enjoying a better and colder climate. Their courage is equal at all times to that of any natives of India; and when wrought upon by prejudice or religion, is quite desperate. They are all horsemen, and have no infantry in their own country, except for the defence of their forts and villages, though they generally serve as infantry in foreign armies. They are bold, and rather rough in their address, which appears more to a stranger from their invariably speaking in a loud tone of voice: but this is quite a habit, and is alike used by them to express the sentiments of regard and hatred. The Sikhs have been reputed deceitful and cruel, but sir John Malcolm knew no grounds upon which they could be considered more so than the other tribes of India: they seemed to him, from all the intercourse he had with them, to be more open and sincere than the Mahrattas, and less rude and savage than the Afghans. They have, indeed, become, from national success, too proud of their own strength, and too irritable in their tempers, to have patience for the wiles of the former: and they retain, in spite of their change of manners and religion, too much of the original character of their Hindoo ancestors, (for the great majority are of the Hindoo race,) to have the constitutional ferocity of the latter. The Sikh soldier is, generally speaking, brave, active, and cheerful; without polish, but destitute neither of sincerity nor attachment; and, if he often appears wanting in humanity, it is not so much to be attributed to his national character, as to the habits of a life, which, from the condition of the society in which he is born, is generally past in scenes of violence and rapine.

The Sikh merchant, or cultivator of the soil, if he is a Sinh, differs little in character from the soldier, except that his occupation renders him less presuming and boisterous.

He also wears arms, and is, from education, prompt to use them, whenever his individual interest, or that of the community in which he lives, requires him to do so. The general occupations of the Khalafa Sikhs has been before mentioned. Their character differs widely from that of the Sinhs. Full of intrigue, pliant, versatile, and insinuating, they have all the art of the lower classes of Hindoos, who are usually employed in transacting business; from whom, indeed, as they have no distinction of dress, it is very difficult to distinguish them.

The general character of the religious tribes of Acalis, Shahid, and Nirmala, is formed from their habits of life. The Acalis are insolent, ignorant, and daring: presuming upon those rights which their numbers and fanatic courage have established, their deportment is hardly tolerant to the other Sikhs, and insufferable to strangers, for whom they entertain a contempt which they take little pains to conceal. The Shahid and the Nirmala, particularly the latter, have more knowledge and more urbanity; they are almost all men of quiet, peaceable habits; and many of them are said to possess learning.

There is another tribe among the Sikhs, called the Nanac Pautra, or descendants of Nanac, who have the character of being a mild, inoffensive race; and though they do not acknowledge the institutions of Guru Govind, they are greatly revered by his followers, who hold it sacrilege to injure the race of their founder; and, under the advantage which this general veneration affords them, the Nanac Pautra pursue their occupations; which, if they are not mendicants, is generally that of travelling merchants. They do not carry arms; and profess, agreeably to the doctrine of Nanac, to be at peace with all mankind.

The Sikh converts continue, after they have quitted their original religion, all those civil usages and customs of the tribes to which they belonged, that they can practise, without infringement of the tenets of Nanac, or the institutions of Guru Govind. They are most particular with regard to their intermarriages; and on this point, Sikhs descended from Hindoos almost invariably conform to Hindoo customs, every tribe intermarrying within itself. The Hindoo usage regarding diet, is also held equally sacred; no Sikh descended from a Hindoo family ever violating it, except upon particular occasions, such as a Guru-mata, when they are obliged, by their tenets and institutions, to eat promiscuously. The strict observance of these usages has enabled many of the Sikhs, particularly of the Jat and Gujar tribes, which include almost all those settled to the south of the Setlej, to preserve an intimate intercourse with their original tribes; who, considering the Sikhs not as having lost cast, but as Hindoos that have joined a political association, which obliges them to conform to general rules established for its preservation, neither refuse to intermarry, nor to eat with them.

We shall here add, that the "Jats" are Hindoos of a low tribe, who, taking advantage of the declining state of the Mogul empire, have, by their courage and enterprise, raised themselves to some consequence on the north-western parts of Hindoostan, and many of the strongest forts of that part of India are still in their possession. The "Gujars" are also Hindoos, and have raised themselves to power by means not dissimilar to those used by the Jats. Almost all the thieves in Hindoostan are of this tribe.

The higher cast of Hindoos, such as Brahmens and Chatriyas, who have become Sikhs, continue to intermarry with converts of their own tribes, but not with Hindoos of the cast they have abandoned, as they are polluted by eating animal food, all kinds of which are lawful to Sikhs, except the cow, which it is held sacrilege to slay.

The Mahometans, who become Sikhs, intermarry with each other, but are allowed to preserve none of their usages, being obliged to eat hog's flesh, and abstain from circumcision.

The Sikhs are forbidden the use of tobacco, but allowed to indulge in spirituous liquors, which they almost all drink to excess; and it is rare to see a Sikh soldier, after sunset, quite sober. Their drink is an ardent spirit, made in the Panjab; but they have no objection to either the wine or spirits of Europe, when they can obtain them.

The use of opium to intoxicate is very common with the Sikhs, as with most of the military tribes of India. They also take b'hang (cannabis fativa), another inebriating drug.

The conduct of the Sikhs to their women differs in no material respect from that of the tribes of Hindoos, or Mahometans, from whom they are descended: their moral character, with regard to women, and indeed in most other points, may, from the freedom of their habits, generally be considered as much more lax than that of their ancestors, who lived under the restraint of severe restrictions, and whose fear of excommunication from their cast, at least obliged them to cover their sins with the veil of decency. This the emancipated Sikhs despise; and there is hardly an infamy which this debauched and dissolute race are not accused, and with justice, as Sir John Malcolm believed, of committing in the most open and shameful manner.

The Sikhs are almost all horsemen, and they take great delight in riding. Their horses were formerly famous for their strength, temper, and activity; but they are now no better mounted than the Mahrattas.

Their horsemen use swords and spears, and most of them now carry match-locks, though some still use the bow and arrow, a species of arms for excellence in the use of which their forefathers were celebrated, and which their descendants appear to abandon with great reluctance.

The education of the Sikhs renders them hardy, and capable of great fatigue; and the condition of the society in which they live, affords constant exercise to that restless spirit of activity and enterprise which their religion has generated. Such a race cannot be epicures; they appear, indeed, generally to despise luxury of diet, and pride themselves in their coarse fare. Their dress is also plain, not unlike the Hindoos, equally light, and divested of ornament. Some of the chiefs wear gold bangles, but this is rare; and the general characteristic of their dress and mode of living is simplicity.

The principal leaders among the Sikhs affect to be familiar and easy of intercourse with their inferiors, and to despise the pomp and state of the Mahometan chiefs; but their pride often counteracts this disposition; and they appear to have, in proportion to their rank and consequence, more state, and to maintain equal, if not more reserve and dignity with their followers, than is usual with the Mahratta chiefs.

It would be difficult, if not impracticable, to ascertain the amount of the population of the Sikh territories, or even to compute the number of the armies which they could bring into action. They boast that they can raise more than a hundred thousand horse; and, if it were possible to assemble every Sikh horseman, this statement might not be an exaggeration; but there is, perhaps, no chief among them, except Ranjit Singh, of Lahore, that could bring an effective body of four thousand men into the field; and the force of Ranjit Singh did not, in 1805, amount to eight thousand, and part of that was under chiefs who had been subdued from a state of independence, and whose turbulent minds ill-brooked an usurpation, which they deemed sub-

versive of the constitution of their commonwealth. His army is now more numerous than it was, but it is composed of materials that have no natural cohesion, and the first serious check which it meets will probably cause its dissolution.

As for the religion of the Sikhs, it seems, says Sir John Malcolm, to have been a sort of pure deism, grounded on most sublime general truths, blended with the belief of all the absurdities of the Hindoo mythology, and the fables of Mahometanism; for Nanac professed to conciliate Hindoos and Mahometans to the belief of his doctrine, by persuading them to reject those parts of their respective belief and usages, which, he contended, were unworthy of that God whom they both adored. He endeavoured to impress both Hindoos and Mahometans with a love of toleration, and an abhorrence of war; and his life was as peaceable as his doctrine.

We cannot forbear remarking on the inconsistency and contradiction which are involved in the idea of "pure deism" blended with the belief of absurdities. As well might we call a system of philosophy perfect, the greater part of which is nonsense. Is it not evident, says an anonymous writer, that so far as absurdities are mixed with a religious creed, so far the purity of its deism is excluded.—But to proceed; Guru Govind, as we have already suggested, gave a new character to the religion of his followers, by establishing institutions and usages, which not only separated them from other Hindoos, but which, by a complete abolition of all distinctions of cast, destroyed a system of civil polity, which, from being interwoven with the religion of a weak and bigotted race, fixed the rule of its priests upon a basis that had withstood the shock of ages. For further particulars we must refer to the author, whose elaborate account of the Sikhs has furnished the principal materials of this article. Malcolm's Sketch of the Sikhs, in vol. xi. of the Asiatic Researches; or Sketch of the Sikhs, &c. London, 1812. Reanell's Memoir, Introd. Edin. Rev. No. 42.

SIKI, in *Geography*, a town of Asiatic Turkey, in Carmania, on the Draganto; 27 miles W. of Selekkeh.

SI-KIANG, or *West River*, a river of China, which rises near Fong-tcheou, in Quang-tong, and runs into the sea, S. of Canton.

SIKIATZKOI, a town of Russia, on the Lena; 140 miles N. of Ziganak. N. lat. 69° 20'. E. long. 121° 40'.

SIKINOS, an island in the Grecian Archipelago, which lies seven or eight miles to the W.S.W. of Nio. This island is lofty and mountainous, of small extent, being about twenty miles in circumference, and contains, according to Olivier, no more than 200 inhabitants. It has no harbour, and is now little frequented by Europeans. Its productions consist of wheat, barley, wine, cotton, and fruits. It pays about 2000 piastres to the captain-pacha. A town of the same name with the island is situated on a rock, which hangs over the sea. N. lat. 36° 43'. E. long. 25° 10'.

SIKKE. See *SREG*.

SIKNA, a river of Moldavia, which runs into the Zita, 20 miles S.W. of Batuzani.

SIKOKO. See *XICOCO*.

SIKOVÖE, a small island in the East Indian sea. S. lat. 7° 12'. E. long. 131° 51'.

SIL, a river of Switzerland, which runs into the Limat, one mile below Zurich.—Also, a river of Spain, in Galicia, which rises in the mountains to the west of Leon, where it receives the Bæza and the Burvia in Galicia, passes on to San-Estevan and to Torbe, where it receives the Lor, and
in

in its turn falls into the Mino; its course is thirty-three leagues.

SIL, in *Canals*, the bottom timber of sluices, lock-gates, &c.

SIL, in *Natural History*, a name given by the ancients to a red ochre, of which they had three distinct kinds, the *sil syricum*, *sil atticum*, and *sil marmorosum*; all of which are to be had at this time, and all very valuable paints.

SIL *Syricum* is a substance well known among the painters of the present age, though not by name, being the red ochre, commonly used for a purple colour in their coarser works; though it is capable of yielding, by proper management, a colour fit for their finest. It is very heavy, and of a fine strong red, with some tendency to purple, of a loose friable texture, and very rough and dirty surface. It adheres firmly to the tongue, is somewhat soft to the touch, crumbles easily to pieces between the fingers, and stains the hands very much. It melts freely in the mouth, and has a strongly astringent taste. It burns to a much paler colour, and makes no effervescence with aqua fortis. These are the characters by which this is distinguished from all the other red earths. It is dug in many parts of England, and is sent to London in great quantities. Hill.

SIL *Atticum* is the purple ochre, called in later times *almagra*.

SIL *Marmorosum* is also a substance in some degree known in the world at this time. It sometimes falls into the hands of our painters, who call it Indian stone-red, but it has many other valuable qualities extremely worth enquiring into. It is the hardest and driest of all the ochres, and while in the stratum appears absolutely stony, forming thin, flat, regular strata, and is so hard, that it is not to be dug without the pick-axe; it is also of an obscurely and irregularly laminated structure, and naturally breaks into flat pieces. It is of a fine purplish-red, and very heavy, and contains a multitude of fragments of a fine lead-ore, which are bright and blueish, and makes a very pretty appearance, and beside these has always among it a small quantity of pure native cinnabar: both these substances are so nicely mixed with it, that it is scarcely possible to break off a piece of an inch square from any part of the strata that has not more or less of both in it. It is of a dirty surface, and rough to the touch, and adheres very firmly to the tongue, and stains the hands. It is of a very austere and astringent taste, and makes no effervescence with acids. There are considerable strata of it on the borders of China, and it is much used as a paint in the East Indies. There is some of it at times brought over to us, but not enough to make it a regularly marketable commodity. Beside its use as a paint, it is worth enquiring into on account of the cinnabar it contains; three ounces of it having yielded, on trial, two drachms and a scruple of pure quicksilver. Hill.

SILA, in *Ancient Geography*, a forest of Italy, in Brutium, N. of the town of Rhegium, occupying part of the Apennines. Strabo.—Also, a town situated at a considerable distance from Japygia.

SILACH, a word used by medical authors for a disorder of the eye-lid, consisting in a preternatural thickness of it, or a swelling without inflammation.

SILADING, in *Geography*, a small island in the East Indian sea, near the N. coast of Celebes. N. lat. $1^{\circ} 21'$. E. long. $124^{\circ} 25'$.

SILÆ, in *Ancient Geography*, a town situated in the interior of Arabia Felix. Ptol.

SILAH-ETCHAUK, in *Geography*, a town of Bengal; 25 miles N.W. of Ramgur.

VOL. XXXII.

SILAI, a town of Hungary; 32 miles S. of Zatmar.

SILAMBOE, a town on the S. coast of the island of Java. S. lat. $7^{\circ} 33'$. E. long. $107^{\circ} 15'$.

SILANDAM, in *Ancient Geography*, a town of Asia Minor, in Lycia.

SILARUS, a river of Italy, which commenced in the territory of the Hirpini, separated the Picentini from Lucania, and discharged itself into the sea near Pœstum. Strabo says, that this river petrified the plants that were thrown into it, without destroying their colour or their form.—Also, a mountain of Italy, in Lucania.

SILAS, a river of India, which sprung from a fountain of the same name, and ran into the country of the Silæans, according to Arrian.

SILATUM, a word used by the ancient Romans to express a morning's draught of wine. This was usually of a wine medicated with the plant fili, or feseli, and thence had its name. It has always been the custom to medicate the morning draughts of any strong liquor; we do it with wormwood, or the common bitter tincture; the Indians with ginger.

SILAVENGO, in *Geography*, a town of Italy, in the Novarese; 10 miles N.W. of Novara.

SILAUM, in *Botany*, a name used by some authors for the *saxifraga pratensis*, or common meadow saxifrage.

SILAUNA, in *Geography*, a town of European Turkey, in Bulgaria; 40 miles W. of Nicopoli.

SILBACH, a village of Westphalia, in which is found lead-ore mixed with silver; 12 miles S. of Brilon.

SILBE, a town of Africa, in the country of the Foola, on the Senegal. N. lat. $17^{\circ} 5'$.

SILBERBACH, a town of Prussia, in the province of Oberland; 6 miles W. of Liebstdt.

SILBERBERG, a mine-town of Silesia, belonging to the principality of Brieg, but insulated in that of Munsterberg. N. lat. $50^{\circ} 24'$. E. long. $16^{\circ} 26'$.

SILBEREGG, a town of the duchy of Carinthia; 2 miles N.W. of Ebernstein.

SILBERMANN, JOHANN ANDREAS, in *Biography*, the most eminent and renowned organ-builder and maker of keyed-instruments in Germany. He was born at Straßburg in 1712, and the first of a numerous and eminent family of that name, who have inherited his professional abilities and reputation. There is, in Gerber's Continuation of Walther's Musical Lexicon, a list of their several names and works; but old Silbermann was the *Father Smith* of Germany. His instruments are prized above all others for workmanship and tone. The Bach family have been always partial, not only to Silbermann's organs, but harpsichords and clavichords. When we heard Emanuel Bach perform at Hamburgh, it was always on a favourite Silbermann clavichord; piano fortes were not then brought to great perfection any where; but since that time we find that John Henry Silbermann is much celebrated for his piano fortes.

SILBERSCHLAG, JOHN ISAIAH, a German mathematician and mechanist, was born in 1721. He studied at the college Klosterberge, near Magdeburg, and afterwards went through a course of theology at Halle, from which place he returned to the college at which he had been before, where he taught natural philosophy and mathematics for nine years. After this he became pastor of one of the churches at Berlin, and rector of the royal school. He was a member of the Academy of Sciences in that city; and, besides writing various works on mechanical and mathematical subjects, constructed a great many machines, instruments, and models, for the use of the students in the seminary which had been placed under his care. He died

in November 1791. He left behind him a great number of works, among which are, "A Treatise on the warlike Machines of the Ancients;" "Letters on the Northern Lights;" "A Treatise on Hydraulic Architecture;" "The Chronology of the World rectified by the Scriptures." Gen. Biog.

SILBERSTRASS, in *Geography*, a town of Saxony, in the circle of Erzgebirg; 4 miles S.S.E. of Zwickau.

SILBIUM, in *Ancient Geography*, a town of Italy, in Japygia.—Also, a town of Asia, in Greater Phrygia.

SILBODAL, in *Geography*, a town of Sweden, in the province of Warmeland; 35 miles W. of Carlstadt.

SILBOJOCK, a town of Sweden, in the Lapmark of Pitea; 12 miles N. of Niarg.

SILBURY HILL, one of the largest barrows or tumuli in England; and probably in the world, is situated on the Marlborough Downs, about six miles west of the town of Marlborough, in Wiltshire. The origin, appropriation, and history of this extraordinary mound of earth, are alike unknown to the topographer and antiquary. In the vicinity of the immense druidical temple at Avebury, (see AVEBURY,) it is rationally supposed to have been originally connected with that structure: and as the most remote antiquities of this island, and of the civilized world, have given rise to much fabulous dissertation, and fanciful hypothesis, to the barrow now called Silbury Hill has been referred to various tribes of people, applied to different purposes, and attributed to the most remote origin. Dr. Stukeley was of opinion that its present name is of Saxon derivation, and signifies "the great or marvellous hill;" while others contend that it is either a corruption for Sil-barrow, which they translate "the peaceful grave;" or of Sel-barrow, meaning "the large or elevated barrow." The most common supposition respecting its nature ranks it among the sepulchral class of monuments. Stukeley calls it the tomb of Cunetha, whom he characterizes as a celebrated British king, who resided at *Cunetio* (then supposed to have been Marlborough), and gave his name to that town, and to the river Kennet, or Kunnet. The Rev. Samuel Greathead, in a letter to Mr. Britton, printed in the account of Wiltshire, in the 15th volume of the "Beauties of England and Wales," regards Silbury as the burial-place of Prydain, a later king of the Britons, to whom he ascribes the union of the British tribes under one monarchy, and the construction of Avebury, as a place of assembly for the chiefs and people on great national occasions. Another opinion respecting this tumulus is, that it was the mount on which the Druids lighted up fires, when they wished to give notice to the surrounding country of some intended religious ceremonial. This view of the subject is of course confined to those who consider Avebury as having been a druidical temple; among whom is the Rev. Edward Davies, author of "Celtic Researches," and of "The Mythology and Rites of the British Druids." To these opinions relative to Silbury Hill may be added a third, which may be regarded as equally probable with any of the conjectures above stated. It is, that, like the Tinwald of the Isle of Man, and the Moote-hill of Scone, it was the mount of justice, the eminence from the summit of which the king promulgated the laws enacted in the national assemblies, and on which he and his judges sat to decide all important causes, whether of a civil or criminal nature.

Silbury Hill is situated directly south from Avebury, and nearly in the centre between the extremities of the two avenues, which extended from the temple to the distance of a mile each way. At the base the hill is about 560 feet in diameter, or 1680 feet in circumference; at the top, 105 feet diameter, or 315 feet in circumference; and it rises 170 feet in per-

pendicular height. Stukeley estimates its solid contents at 13,558,809 cubic feet, and highly praised the choice of the ground, and the symmetrical proportions of the structure itself. In digging here in 1723, a human skeleton, with the bit of a bridle, deer's horns, and an iron knife, were discovered, which Dr. Stukeley confidently considered to have belonged to the person for whom he supposed the mount was raised; but the posture of the skeleton near the surface and on a declivity would render such a conclusion extremely improbable, even though it were undoubted that Silbury is of sepulchral origin. Stukeley's *Abury*, folio, 1743. *Beauties of England and Wales*, by J. Britton, F.S.A. 8vo. 1814.

SILCHESTER, a parish in Hampshire, England, at the northern extremity of that county, bordering on Berkshire, contains the site and ruins of an ancient Roman station. It appears also to have been a city of the Belgic Britons anterior to the Roman colonization of Great Britain, and was called *Caerfeiont*, or *Segont*, as being the chief city of the *Sagontiaci*. In the seventh Iter. of Antoninus it is named *Vindomim*, and marked xxi miles from *Venta-Belgarum* (Winchester), and xv from *Callevam* (probably Reading.) That this was a Roman station of importance, appears evident from the various roads, or viæ, branching from it; from the magnitude and construction of the walls, valla, and amphitheatre; and from the numerous coins and other relics that have been found here at different periods. The whole city, or station, was surrounded by a foss, with a vallum on the inside, on which a wall was raised. This was constructed, in the usual Roman manner, with alternate layers, or rows of large flat stones, rubble stones, and cement, also bricks and flints. In one place this wall was twenty-four feet thick, and the foss was above 100 feet across. The exterior form of this station is unlike any other Roman work in England, being an irregular octagon; whereas those of *Camalodunum* (Colchester), *Venta-Belgarum* (Winchester), *Lindum* (Lincoln), *Londinium* (London), and almost all others, were constructed in the shape of a parallelogram, with the corners rounded off. The inclosed area of Silchester is about one mile and a half in circumference, and contains nearly one hundred acres, the whole of which is appropriated to the arable and pasture lands of a farm. In very dry seasons, it is easy to trace the situation and direction of the Roman streets, two of which intersected the town, and communicated with the four entrance gates, on the east, west, north, and south sides of the city. Near the centre of the area have been traced the foundations of a large edifice, supposed to have been the forum. About 150 yards from the north-east corner of the walls, are the banks of an amphitheatre, which appears to have contained five rows, or terraces for spectators. A small church and a farm-house, with its offices, are all that now remain within the ancient walls; and thus present an amazing contrast to the appearance and pursuits of former times. Now the humble and useful husbandman, with the humane Christian pastor, are the chief occupants of this peaceful spot, which, in the third century, was peopled with Roman soldiers, and was often the theatre of remorseless battles, savage sports, and senseless Pagan ceremonies. A particular account of this place will be found in the 6th volume of "The Beauties of England," by J. Britton and E. W. Brayley.

SILCOLU, a town of Hindoostan, in Myfore; 8 miles S.E. of Seringapatam.

SILDA, in *Ancient Geography*, a town of Africa, in Mauritania Cæsariensis, according to Ptolemy. The Itinerary of Antonine places this town on the route from Tocolosida to Tingis, between *Aquæ Daciæ* and *Vospiscanæ*.

SILDE

SILDE REVEL, in *Geography*, a cluster of small islands belonging to Denmark, in the Cattegat; 6 miles S. of Læsøe.

SILE, in *Ancient Geography*, a town of Lower Egypt, on the route from Serapium to Pelusa, between Magdolum and Thauhafium, according to the Itinerary of Antonine.

SILE, in *Geography*, a river of Italy, which passes by Treviso, and runs into the Adriatic, opposite to the island of Torcello.

SILE, in *Rural Economy*, provincially the name of a milk-strainer.

SILEBY, in *Geography*, a large and populous village and parish on the eastern bank of the river Soar, in the hundred of East-Goscote, and county of Leicester, England. The lordship contains about 2139 acres, the greater part of which was inclosed, with other contiguous lands, in conformity to an act of parliament passed in 1759. The manor belongs to earl Ferrers. In the parish were formerly two ancient mansions, belonging to the Sherard and the Pochin families. In 1811 the parish contained 240 houses, and 1200 inhabitants, most of whom were employed in agriculture, and frame-work knitting. Here is one free-school, and three other large schools. The church, a handsome stone building, consists of a nave, aisles, a chancel, a porch, and a tower. The revenues of this church were formerly appropriated to the abbey of St. Ebrulph, in Normandy, which was suppressed by king Henry V. Afterwards the living belonged to the priory of St. Mary, in the isle of Axholme, in the county of Lincoln. Nichols's History and Antiquities of the County of Leicester, folio, vol. iii.

SILEIN, a town of Hungary; 14 miles E.N.E. of Bolefko.

SILENCE, Fr. in *Musical*, equivalent to *rest*; which see.

SILENE, in *Botany*, a name given by Linnæus to this genus, the chief of the Catchfly tribe, in allusion to the viscid frothy moisture of its stalks, by which flies of the smaller kind are numerously entrapped. This word is probably derived from *σινλον*, *saliva*. De Theis deduces it more directly from the drunken god *Silenus*, whose name he supposes to have a similar origin.—Sm. Fl. Brit. 465. Prodr. Fl. Græc. Sibth. v. 1. 290. Ait. Hort. Kew. v. 3. 83. Gært. t. 130. (Silene); Linn. Gen. 226. Schreb. 304. Willd. Sp. Pl. v. 2. 691. Mart. Mill. Dict. v. 4. Pursh 315. Juss. 302. Lamarck Dict. v. 7. 158. Illustr. t. 377. Cucubalus; Linn. Gen. 225. Schreb. 303. Willd. Sp. Pl. v. 2. 684. Mart. Mill. Dict. v. 2. Pursh 315. Juss. 302. Lamarck Dict. v. 2. 219. Illustr. t. 377. f. 2. Viscago; Dill. Elth. 416.)—Class and order, *Dicandria Trigynia*. Nat. Ord. *Caryophylleæ*, Linn. *Caryophyllææ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, tubular, swelling, five-toothed, permanent. **Cor.** Petals five; claws narrow, the length of the calyx, bordered with a membrane; limb flat, horizontal, obtuse, often divided, and mostly furnished, more or less, with a cloven, erect, tooth-like crest at its base, constituting the crown of the flower. **Stam.** Filaments ten, awl-shaped, five alternate ones inserted into the claws of the petals, and later than the rest; anthers oblong. **Pist.** Germen superior, cylindrical; styles three, simple, longer than the stamens; stigmas twisted contrary to the motion of the sun. **Peric.** Capsule cylindrical, ovate, or somewhat globose, covered by the calyx, more or less perfectly three-celled, bursting at the top into six teeth. **Seeds** numerous, kidney-shaped, attached to a central receptacle.

Eff. Ch. Calyx of one leaf, swelling. Petals five, with

erect claws. Capsule superior, imperfectly three-celled, bursting at the top. Seeds numerous.

Obs. The crown of the petals, on which Linnæus depended for his character of *Silene*, in contradistinction to *Cucubalus*, being found not only to separate species most closely related, but even to vary in the same species, as Lamarck and many others have noticed; the authors which stand first on our list of references above, have agreed to remove to *Silene* all the Linnæan *Cucubali*, except *C. baccifer*, on which Tournefort originally founded that genus, which has indeed a crown, but is distinguished by having for its fruit a real berry, not a capsule. See *CUCUBALUS*.

Silene, thus considered, is a vast genus, of which new species are still from time to time discovered, in the warmer and drier regions of the south of Europe, and north of Africa; countries abounding particularly with this tribe of plants. All the species in general are herbaceous, many of them annual, very few shrubby. Their stems are jointed, branched, leafy, frequently glutinous, for a certain space, below each joint. The calyx and flower-stalks are also, when downy, somewhat viscid. Leaves opposite, simple, entire. Petals red or white, rarely greenish or yellowish; scarcely ever blue. Some of the flowers, especially the greenish ones, are deliciously fragrant at night; and the rest, if they have any scent, are sweetest at that time, like the Pink tribe in general. We shall select sufficient examples of the genus, particularly describing such as are new, or hitherto only mentioned in the Prodr. Fl. Græcæ, as well as all those of British growth.

Seet. 1. *Stem racemose; occasionally somewhat forked.*

S. anglica. English Catchfly. Linn. Sp. Pl. 594. Willd. n. 1. Ait. n. 15. Fl. Brit. n. 1. Engl. Bot. t. 1178. Curt. Lond. fasc. 4. t. 30. (Viscago cerasifolia, vasculis pendulis, anglica; Dill. Elth. 417. t. 309. f. 398.)—Hairy and viscid. Petals notched. Flowers lateral, erect, alternate. Lower fruit spreading or reflexed.—Native of cultivated fields, on a light sandy soil, in England and France, flowering in July. The root is fibrous, small and annual. Stem branched, spreading, weak and brittle, leafy, round, hairy, swelling above each joint, usually about a foot high. Leaves lanceolate, acute, entire, green, somewhat hairy; the lower ones obovate. Flowers solitary, on short stalks, alternate from the bosoms of the upper leaves. Calyx with ten ribs, swelling as the fruit advances. Petals broadly elliptical, cloven, the claw of each crowned with a divided scale; their colour white, occasionally marked with a faint reddish spot.

S. quinquevulnera. Variegated Catchfly. Linn. Sp. Pl. 595. Willd. n. 3. Ait. n. 17. Pursh n. 1. Fl. Brit. n. 2. Engl. Bot. t. 86. (Lychnis hirta minor, flore variegato; Tourn. Inst. 337. Dodart Mem. ed. Amst. 601. t. 23.)—Hairy. Petals roundish, entire. Flowers lateral, alternate, erect, as well as the fruit.—Native of dry or sandy fields in the south of Europe and the Levant. Mr. Hudson found it near Wrotham in Kent; and Mr. Pursh near Charlestown, Carolina, on the sea-coast. We presume this species to have been carried from Europe to America, being a common hardy annual in gardens, where it flowers in June and July. The plant is not viscid like the preceding, though hairy. The petals are remarkable for a brilliant crimson spot in the middle of each. The lowest capsules are sometimes reflexed.

S. nocturna. Spiked Night-flowering Catchfly. Linn. Sp. Pl. 595. Willd. n. 6. Ait. n. 18. Pursh n. 6. Sm. Fl. Græc. Sibth. t. 408, unpublished. (Viscago hirta noctiflora, floribus obsoletis spicatis; Dill. Elth. 420. t. 310. f. 400. Lychnis sylvestris hirsuta elatior spicata,

SILENE.

lini colore; Barrel. Ic. t. 1027. f. 1.)—Flowers spiked, alternate, nearly sessile, directed one way. Petals deeply cloven. Leaves spatulate, hairy.—Native of Spain, the south of France, vineyards about Constantinople, and cultivated ground in Greece; also of Virginia; flowering in June and July. An annual, upright, slightly branched species; the leaves which accompany the flowers narrow, and much smaller than the rest. Petals small, pale pink, or white with a green external tinge, minutely crowned. Capsule ovate, stalked. The flowers are said to expand at night only.

S. pendula. Pendulous Catchfly. Linn. Sp. Pl. 599. Willd. n. 27. Ait. n. 37. Prodr. Fl. Græc. n. 979. Curt. Mag. t. 114. (*Viscago hirta* ficula, *lychnidis aquaticæ* facie, *supina*; Dill. Elth. 421. t. 312.)—Flowers racemose. Calyx of the fruit pendulous, inflated, with ten rough ribs. Stem decumbent.—Native of Italy, Sicily, Crete, and Cyprus, flowering in the spring. Every bank about Rome is decorated with this elegant plant in the spring. Nothing is better calculated for the decoration of rock-work, or dry parterres, than this hardy annual, whose purplish stems spread in every direction, and are copiously adorned with large pink flowers, with a membranous, violet-ribbed, inflated calyx. The seeds scatter themselves without any trouble.

S. vespertina. Pink Evening Catchfly. Retz. Obf. fasc. 3. 31. Willd. n. 24. Ait. n. 35. Curt. Mag. t. 677. Sm. Fl. Græc. Sibth. t. 409, unpublished. (*S. bipartita*; Desfont. Atlant. v. 1. 352. t. 100. *S. ciliata*; Willd. n. 4, excluding the synonym. *Lychnis marina* *hirta* *purpurea*, *leucoji* folio; Barrel. Ic. t. 1010.)—Petals with two deep rounded lobes, and a sharp cloven crest. Calyx downy. Leaves spatulate. Stems diffuse.—Found on the sea-shores of Sicily, Barbary, Crete, Zante, and Greece, not uncommon. It has been known about twenty years in our gardens, as a hardy annual, flowering in summer. Linnæus had specimens, but never determined the species. The stems bear numerous spatulate leaves. The flowering branches are naked below, each terminating in a simple cluster of eight or ten handsome bracteated pink flowers, all drooping one way, with a reddish club-shaped calyx. The pubescence, especially of the calyx, is more close and soft than in *S. pendula*, though more long and shaggy in some specimens than others. The stem is very rarely once forked, being usually altogether racemose.

S. discolor. Pale Spiked Catchfly. Prodr. Fl. Græc. n. 981. Fl. Græc. t. 410, unpublished.—Petals with two deep narrow segments, and a notched crest. Calyx villous. Leaves obovate. Stem diffuse.—Gathered by Dr. Sibthorp, in the isle of Cyprus. The root is annual, long. Stems spreading, scarcely a span in length, not forked, though mostly once divided, round, leafy, reddish, rough, like the rest of the herbage, with long spreading hairs. Leaves thick and broad, rather more than an inch in length; the lower ones tapering at the base. Flowers six or eight in each spike, erect, on short partial stalks. Calyx rather slender, hardly an inch long, with ten red hairy ribs. Limb of each petal nearly as long as the claw; pale red on the upper side; light green, with darker veins, beneath; crest white, divaricated, double-toothed.

S. thymifolia. Thyme-leaved Catchfly. Prodr. Fl. Græc. n. 982. Fl. Græc. t. 411, unpublished.—Petals with two deep narrow segments, and a notched crest. Calyx hairy, glutinous. Stems procumbent, woody, much branched. Found by Dr. Sibthorp on the sandy shores of Caria and the isle of Cyprus. Root perennial. Stems a foot or two in length, widely spreading, repeatedly branched,

copiously jointed, round, hairy, sending up several terminal, ascending, simple, leafy, hairy, and rather viscid, flowering branches, from three to six inches long. Leaves obovate, acute, rough, about half an inch long, with axillary tufts of still smaller ones. Flowers racemose, three or four at the top of each branch, erect, white; the back of the petals greenish. Calyx an inch long, hairy, pale green, with pink dots.

S. cerasioides. Cerasium-leaved Catchfly. Linn. Sp. Pl. 596. Willd. n. 8. Ait. n. 20. Fl. Græc. t. 412, unpublished. (*Viscago ceratii* foliis, *vasculis erectis* *fessilibus*; Dill. Elth. 416. t. 309. f. 397.)—Hairy. Petals cloven; crest divided, with a pair of teeth at the base. Stem much branched, spreading, somewhat forked. Leaves linear-lanceolate.—Native of the south of Europe, and of Asia Minor. A hardy annual, flowering in summer, about a span high. Leaves narrow, acute, green, very hairy, an inch or inch and half long. Flowers rose-coloured, spiked, not quite sessile. Calyx very hairy, half an inch long, white, with five green ribs. Floral leaves the length of the calyx. Capsule nearly globose, stalked, with five teeth. Seeds rugged, black.

S. dichotoma. Forked Long-branched Catchfly. Ehrh. Beitr. v. 7. 143. Pl. Select. n. 65. Willd. n. 23. Fl. Græc. t. 413, unpublished. (*S. trinervis*; Soland. in Russell's Aleppo, ed. 2. 252.)—Petals in two deep narrow segments, with scarcely any crown. Stem forked, racemose, villous as well as the leaves.—Native of Hungary and the Levant. Dr. Sibthorp met with it in Crete, and about the Bithynian Olympus. We believe this species was raised, about 25 years ago, in many gardens about London, from seeds sent by the late Mr. Davall, so that it is entitled to a place in the *Hortus Kewensis*. Root biennial, tapering, as thick as a common radish. Stems several, ascending, from one to two feet high, round, shaggy with long spreading hairs, once or twice forked, with an intermediate, nearly sessile, flower, and then extended into long, simple, spiked or racemose branches, each bearing five or six distant white flowers, whose petals are narrow, with only occasional rudiments of a crest. Calyx with ten green ribs. Anthers green. Seeds red-brown. The leaves are chiefly radical, and very numerous, composing a dense, shaggy, hoary, and somewhat glaucous, tuft; each leaf two inches long, and nearly one broad, obovate, bluntly pointed, tapering down into a broad footstalk.

S. divaricata. Forked Spreading-branched Catchfly. Sm. Prodr. Fl. Græc. n. 985. Fl. Græc. t. 414, unpublished.—Petals in two deep rounded lobes, with a cloven crest. Stem forked, divaricated, racemose. Leaves all lanceolate, hairy, acute. Discovered by Dr. Sibthorp on the coast of Asia Minor. In size and habit this bears some affinity to the last, but is more leafy, and the leaves are longer, tapering at each end, undulated, of a darker green, rough with shorter hairs, not shaggy. The flowering branches spread at almost right angles. The flowers are white, but with much broader and rounder petals, each petal bearing a rounded cloven crest.

SECT. 2. Stem forked, with panicled branches.

S. inflata. Common Bladder Campion or Catchfly. Fl. Brit. n. 5. Prodr. Fl. Græc. n. 986. Ait. n. 1. (*Cucubalus Behen*; Linn. Sp. Pl. 591. Willd. Sp. Pl. v. 2. 684. Engl. Bot. t. 164. Fl. Dan. t. 914. Behen album; Ger. Em. 678.)—Flowers panicled, drooping. Petals cloven half way down, mostly naked. Calyx smooth, reticulated with veins. Stem erect.—Common in dry fields, pastures, and by way-sides throughout Europe, from Norway to Greece, flowering in the middle of summer. Michaux

SILENE.

chaux noticed it in Canada. The *root* is perennial, long, whitish, branching at the summit. *Stems* erect, a foot and a half or two feet high, branched, round, glaucous. *Leaves* ovato-lanceolate, acute, glaucous, usually very smooth, but occasionally roughish and fringed; the radical ones numerous, crowded, spatulate. *Panicle* forked, bearing numerous white drooping *flowers*. *Calyx* almost globose, membranous, white, elegantly reticulated with green or purplish veins and ribs. Limb of each petal almost as long as its claw, cut half way down into two spreading, oblong, somewhat rounded segments, generally destitute of a crest, but we have sometimes detected the rudiments of one. *Antthers* green, occasionally liable to a disease, by which they become enlarged, teeming with useless purple dust, which stains the petals. The natives of Zante, who call this plant *κεκόμης*, eat the boiled leaves, which are said to partake of the flavour of green peas.

S. maritima. Sea Campion or Catchfly. With. 414. Fl. Brit. n. 6. Engl. Bot. t. 957. Willd. n. 29. Ait. n. 23. (*S. amœna*; Hudf. Angl. 188. Lightf. Scot. 227. Cucubalus Behen β; Linn. Sp. Pl. 591. Fl. Dan. t. 857. Lychnis marina anglicana; Bauh. Hist. v. 3. p. 2. 357. Ger. Em. 469. Lob. Ic. 337.)—Flowers nearly solitary, terminal. Petals cloven about half way down; the segments of their crest entire. *Calyx* smooth, reticulated with veins. Stem decumbent.—Native of the sandy or rocky sea-shores of Norway, Britain, Gothland, &c. as well as of the stony beds of mountain torrents in Wales, flowering in August and September. The appearance of the *leaves* and *flowers*, at first sight, is so like *S. inflata*, that most botanists, for a long time, considered the plant as a mere variety of that species. They are indeed so nearly akin, as to be inseparable with respect to genus, though *inflata* is mostly without a crown to the *flower*, and this is always furnished with one. The *root* of *S. maritima* is creeping, and the *stems* often quite prostrate, hardly a span high, bearing one *flower*, for the most part, rarely two or three, scarcely constituting a *panicle*. The *leaves* are narrower, linear-lanceolate, or slightly spatulate, very smooth and glaucous, minutely toothed at the edges. *Calyx* much like the last. *Capful* shorter, almost globular. *Styles* occasionally varying to four or five.

S. fimbriata. Fringed Campion or Catchfly. Sims in Curt. Mag. t. 908. Ait. n. 46.—Flowers panicked, drooping. Petals divided, many-cleft; the segments of their crest cloven. *Calyx* veined, downy. Stem erect.—Native of mount Caucasus, from whence it was sent to Sir Joseph Banks and Mr. Loddiges. A hardy perennial, readily increased by seeds, and flowering all summer long. The whole plant resembles a large roughish variety of *S. inflata*, but the deeply fringed *petals*, and their evident *crest*, at once distinguish it.

S. fabaria. Thick-leaved Campion or Catchfly. Prodr. Fl. Græc. n. 987. Fl. Græc. t. 415, unpublished. Ait. n. 2. (Cucubalus fabarius; Linn. Sp. Pl. 591. Willd. Sp. Pl. v. 2. 685. Been album, seu Polemonium saxatile, fabariæ folio, ficulum; Bocc. Mus. 133. t. 92.)—Flowers clustered, crowded, drooping. Petals in two deep, rather narrow, lobes; the segments of their crest notched. Leaves obovate, with a small point.—Native of rocky places near the sea, in Sicily, Asia Minor, Mount Athos, and the isle of Samos. *Root* perennial. *Plant* very glaucous and smooth, twice as tall as the *inflata*, with much thicker and broader *leaves*. The *stem* is once or twice forked, each of its long upright *branches* bearing several remote, short, tufted *clusters* of drooping white *flowers*, with a reticulated, purplish, tumid, angular *calyx*; and *stalks*, with pointed

bracteas, all of the same hue. The limb of each *petal* is half the length of its claw, in two narrow-obovate, spreading lobes; the crest deeply divided, with sharply crenate segments. *Germen* red in the lower half, green above. *Capful* nearly globose. The present species is obviously, according to the Linnæan character itself, a *Silene*, and too closely related to the three preceding, and the following, to be separable from any of them, even in a section of a genus.

S. Behen. Oriental Bladder Campion or Catchfly. Linn. Sp. Pl. 599. Willd. n. 25. Ait. n. 36. Fl. Græc. t. 416, unpublished. (Viscago vesicaria cretica, parvo flore purpurascens; Dill. Elth. 427. t. 317.)—Flowers in a corymbose panicle, nearly upright. Petals deeply divided, rounded; the segments of their crest notched. *Calyx* reticulated. Leaves obovato-lanceolate.—Native of Crete, Asia Minor, and Greece.—The *root* of this is annual. *Herb* less glaucous than the last, and more approaching in habit to our common *S. inflata*; but the *flowers* are smaller, and essentially different. The limb of each *petal* is but a quarter the length of its claw, pale pink, in two elliptical, or almost orbicular, lobes, with a white crest, of two, quite separate, notched segments. *Germen* elevated on a stalk of its own length, along with the *petals* and *stamens*, within the *calyx*, as is more or less the case with most of this genus.

S. casia. Sea-green Campion or Catchfly. Sm. Prodr. Fl. Græc. n. 989. Fl. Græc. t. 417, unpublished. (Lychnis cretica montis Idæ, folio subrotundo cæpio; Tourm. Cor. 24, by the character.)—Flowers in a corymbose panicle, erect. Petals in two deep linear divisions; the segments of their crest entire. Leaves roundish-obovate.—Native of mount Parnassus, and if we are right in Tournefort's synonym, of mount Ida. This delicate smooth species has a very deep perennial *root*, crowned with a dense tuft of numerous, branching, leafy, round, jointed *stems*, nearly a span high, each terminating in one or two naked flowering branches, about a finger's length, bearing a forked *panicle*, of from four to eight pale, but elegant, *flowers*. The *leaves* are full an inch long, and half as broad, of a deep glaucous green, tapering down into short broad *footstalks*, which clasp the stem. *Bracteas* under the partial *flower-stalks* small, ovate, acute. *Calyx* obovate, half an inch long, tipped with pink, and variegated with green and white, but hardly reticulated. *Petals* narrow, cream-coloured; green underneath; their lobes almost close, or parallel, above half the length of the claw. *Styles* and *stamens* rose-coloured, with greenish *anthers*.

S. lavigata. Smooth-cupped Catchfly. Sm. Prodr. Fl. Græc. n. 990. Fl. Græc. t. 418, unpublished.—Panicle spreading. Petals cloven half way down, narrow, without a crest. Leaves roundish-elliptical. *Calyx* very smooth and even, without veins.—Found by Dr. Sibthorp in hilly parts of the isle of Cyprus. The *root* is annual. *Stems* several, from three to eight inches high, leafy below, smooth like every other part of the plant. *Leaves* of a deep glaucous hue; the radical ones obovate, stalked; the rest ovate, less obtuse, and nearly sessile. *Panicles* forked; the partial *stalks* much longer than the *calyx*, which is ovate, reddish, peculiarly even and polished. *Petals* small; their limb pink, in two oblong, obtuse lobes, separated but half way down, and destitute of any crest. *Styles* very downy, rather short.

S. rupestris. White Rock Catchfly. Linn. Sp. Pl. 602. Willd. n. 52. Ait. n. 54. Fl. Dan. t. 4. (Auricula muris alpina glabra; Bauh. Hist. v. 3. 360.)—Panicle spreading. Petals wedge-shaped, emarginate, with a cloven crest. Leaves ovato-lanceolate. *Calyx* smooth, cylindrical, with ten ribs.—Native of dry mountainous situations in Norway,

SILENE.

way, Sweden, Switzerland, and Greece. The *root* is perennial, tufted, bearing several leafy *stems*, four or five inches high, with a somewhat corymbose *panicle*. *Herbage* smooth, green, scarcely at all glaucous. *Leaves* an inch long, acute, varying in length. *Flowers* small, white. *Capsule* splitting from top to bottom into six valves.

S. chlorifolia. Armenian Catchfly. [Sm. Plant. ex Herb. Linn. t. 13. Willd. n. 50. Ait. n. 52. Curt. Mag. t. 807. (*Lychnis orientalis viscosa*, *centaurei lutei folio*, *flore longiflora*; Tourn. Cor. 24.)—*Panicle* spreading. *Petals* cloven half way down, with a two-lobed crest. *Leaves* glaucous, elliptical, pointed. *Calyx* nearly cylindrical, very smooth, without veins.—Gathered by Tournefort in Armenia. Said to have been introduced at Kew in 1796, by Mr. John Hunne-
mann. A hardy perennial, twelve or eighteen inches high, flowering in August, readily known by the general resemblance of its *foliage* to *Chlora perfoliata*, though the *leaves* are not perfoliate. *Flowers* large, erect, in a wide panicle, without scent, white, turning reddish as they fade. *Calyx* above an inch long, tinged with purple, very smooth, without ribs or veins, its form slender, cylindrical, or slightly club-shaped.

S. longipetala. Long-petalled Catchfly. Vent. Jard. de Cels, t. 83. Sm. Prodr. Fl. Græc. Sibth. n. 992. Fl. Græc. t. 419, unpublished.—*Flowers* pendulous. *Petals* in two deep linear segments; with a notched crest, and hairy claw. *Leaves* lanceolate, rough-edged.—Found by Bruguiere and Olivier, in the neighbourhood of Aleppo. Dr. Sibthorp met with the same in the isle of Cyprus. The *root* is annual. *Stem* two feet high, leafy, panicked, spreading, and many-flowered. *Herbage* rather glaucous, smooth, except the edge of the leaves, which is rough to the touch. *Leaves* about three inches long, acute, strongly ribbed; the lower ones elongated and contracted at the base, clasping the stem at the very bottom. *Flowers* green, quite pendulous. *Calyx* obovate, ten-ribbed, smooth, half an inch long. *Claws of the petals* hairy below, as well as the *filaments* and *styles*; limb smooth, very long, involute. *Stigmas* club-shaped, red like the *anthers*.

S. inaperta. Small Greenish Catchfly. Linn. Sp. Pl. 600. Willd. n. 39. Ait. n. 44. Sm. Fl. Græc. Sibth. t. 420, unpublished. (*Viscago lævis*, *inaperta flore*; Dill. Elth. 424. t. 315.)—*Panicle* spreading. *Flowers* erect. *Petals* in two deep narrow segments; with a double awl-shaped crest. *Leaves* linear-lanceolate, smooth.—Native of Madeira. Aiton. Dr. Sibthorp found it on the mountains of Greece. The *root* in his specimens is creeping, and evidently perennial. Dillenius describes it as annual. *Stems* several, near a foot high, clothed in the lower part with numerous smooth green *leaves*, about an inch long; and branching at the top into a *panicle* of a few pale delicate *flowers*, which seem not to have expanded properly in Sherard's garden, whence originated the specific name. In our Greek specimens the *calyx* is slender, rather club-shaped, an inch long, smooth, with ten green ribs. *Petals* widely spreading, greenish-white above, light brown beneath; their crest small, in two simple awl-shaped lobes. *Capsule* ovate, its stalk, within the *calyx*, as long as itself.

S. juncea. Rushy Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 994. Fl. Græc. t. 421, unpublished.—*Panicle* elongated. *Flowers* erect. *Petals* in two deep narrow segments; each lobe of their crest three-toothed. *Leaves* spatulate, all over rough.—Gathered by Dr. Sibthorp in Asia Minor. This has a small, white, annual *root*. *Stem* solitary, erect, two or three feet high; leafy and rough below; terminating in a very long, slender, smooth, slightly spreading *panicle*, of numerous *flowers*, which are rather larger than the pre-

ceding, but with a shorter *calyx*. *Petals* white, with brown veins beneath. The *leaves* are crowded at the root, and bottom of the stem, green, an inch and a half long, somewhat pointed; those about the panicle are awl-shaped and smooth.

S. cretica. Cretan Catchfly. Linn. Sp. Pl. 601. Willd. n. 42. Ait. n. 47. Sm. Fl. Græc. Sibth. t. 432, unpublished. (*Viscago foliis inferioribus bellidis*, *superioribus tunicæ*, *calice strictiore*, et *turgidiore*; Dill. Elth. 422. t. 314. f. 404, 405.)—*Panicle* sparingly branched. *Flowers* erect. *Petals* in two deep divaricated segments; the lobes of their crest acute, entire. Lower leaves obovate, undulated, roughish.—Found by Dr. Sibthorp on rocks near the sea, in Crete and Cyprus, as well as on the coast of Caramania. A hardy annual, springing up spontaneously year after year in Chelsea garden. The *stems* are two or three, from one to two feet high, erect, slender, viscid. *Leaves* green; the lower ones obovate, obtuse and rough; upper linear-lanceolate, acute, smooth. *Flowers* few, small, but not inelegant, crimson, with a smooth, purplish, obovate, ten-ribbed *calyx*. There is an angular tooth to the claw of the *petals*, at each side, below the crest.

S. conica. Corn Catchfly. Linn. Sp. Pl. 598. Willd. n. 21. Fl. Brit. n. 8. Engl. Bot. t. 922. Jacq. Austr. t. 253. Sm. Fl. Græc. Sibth. t. 243, unpublished. (*Lychnis caliculis striatis*, *secunda Clusii*; Ger. Em. 470.)—*Stem* forked. *Petals* cloven half way down; with a rounded cloven crest. *Leaves* soft and downy. *Calyx* of the fruit conical, with thirty ribs.—Native of sandy corn-fields in the south of Europe and the Levant; rare in England, though it still occurs, as in the time of Dillenius, in the sandy parts of Kent, flowering about July. *Root* annual. *Herb* downy and viscid, of a greyish-green. *Stems* solitary or numerous, spreading, various in height, forked and panicked. *Leaves* linear-lanceolate, acute. *Flowers* erect, pale rose-coloured, fragrant, especially at night, with the scent of a honey-suckle. *Calyx* cylindrical, becoming conical as the capsule swells, and membranous, with thirty green ribs, and five long slender teeth. *Petals* nearly obovate, as is also the white crest of each.—The *petals* appear to be sometimes entire, so that we suspect *S. conoidea* of Linnæus may be a variety of this, with smoother broader *leaves*.

S. noctiflora. Night-flowering Catchfly. Linn. Sp. Pl. 599. Willd. n. 31. Fl. Brit. n. 9. Engl. Bot. t. 291. (*Ocymoides noctiflorum*; Camer. Hort. 109. t. 34.)—*Stem* forked. *Petals* rather deeply cloven; with a short blunt crest. *Calyx* with ten angles, connected by transverse ribs; its teeth as long as the tube.—Native of sandy or gravelly fields, in Sweden, Germany, England, Switzerland, Crete, and Asia Minor; not rare in Norfolk and Suffolk, flowering in July. *Root* annual. *Herb* dark green, softly hairy or downy, spreading, of a coarse rank habit. *Leaves* lanceolate, three-ribbed; the lowest obovate. *Flowers* the size of our common *Lychnis dioica*, (their *calyx* and *stalks* very viscid,) unrolling their pale bluish-coloured *petals* in an evening only, when they exhale, in warm weather, a powerful and delicious scent. The strong reticulated ribs of the *calyx* are remarkable.

S. leucophæa. White and Brown Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 1000. Fl. Græc. t. 424, unpublished.—*Petals* in two deep rather narrow segments; with a deeply cloven crest. *Calyx* with ten angles. *Leaves* linear-oblong, recurved, glutinous and hairy. Discovered by Dr. Sibthorp, in the isle of Cyprus. A hairy, glutinous, branching, annual species, about a span high. *Leaves* an inch or inch and half long, green, narrow, obtuse, channelled, somewhat

What revolute, recurved. *Flowers* smaller than the last, especially their *calyx*, which is pale, reddish, destitute of transverse ribs. *Petals* cream-coloured above; of a cinnamon brown beneath; their *crest* in two rounded entire lobes. This is probably a night-scented flower, like the last.

S. ramossissima. Bushy Red Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 1001. Fl. Græc. t. 425, unpublished. (*S. fedoides*; Desfont. Atlant. v. 2. 449? Bivon. Cent. 2. 58. Ocymoides, flore rubro, minus, creticum; Bauh. Hist. v. 3. 352. cap. 59. *Lychnis hirta angustifolia cretica*; Tourn. Init. 337.)—*Petals* deeply divided; with a four-cleft *crest*. *Calyx* club-shaped, with ten angles. *Leaves* spatulate, recurved. *Stem* very much branched.—Native of Crete and Sicily, on rocks near the sea. *Root* annual. Whole *herb* hairy and viscid, green with a brown tint, repeatedly branched from the very bottom, spreading, four or five inches high. *Leaves* about an inch long, obtuse, rather fleshy. *Flowers* very abundant, small, on long, red, hairy stalks, from the forks, sides, and summits of the branches, erect. *Calyx* somewhat obovate, hairy, red, with ten ribs. *Petals* rose-coloured; their limb divided nearly to the bottom; their *crest* white, in four deep awl-shaped segments. *Capful* erect, cylindrical, opening with three spreading, obtuse, cloven teeth. *Seeds* black. That this is *S. fedoides* of signior Bivona Bernardi, in his second *Centuria Sicularum Plantarum*, we have ascertained by specimens from himself, since the publication of Prodr. Fl. Græc. But there is reason for hesitation respecting the plant of Desfontaines, which is probably Willdenow's n. 36; the former describes it as procumbent, with only two appendages to each petal, and the latter cites *Lychnis cretica maritima minima, portulacæ sylvestris folio*, Tourn. Cor. 24, a species unknown to us.

SECT. 3. *Stem* forked, corymbose.

S. rubella. Small-red-flowered Catchfly. Linn. Sp. Pl. 600. Willd. n. 38. Ait. n. 43. Sm. Fl. Græc. Sibth. t. 426, unpublished. (*Viscago lusitanica*, flore rubello vix conspicuo; Dill. Elth. 423. t. 314. f. 406.)—Smooth, corymbose. *Calyx* obovate. *Petals* emarginate; with a rounded two-lobed *crest*. Upper leaves ovato-lanceolate. *Capful* thrice as long as its partial stalk.—Native of fields and waste ground, in Portugal, Rhodes, and Cyprus, flowering in spring. *Root* annual. *Herb* quite smooth, of a glaucous green. *Stem* a foot or more in height, branched from the bottom, leafy; all the branches erect. Lower leaves obovate, recurved, an inch and a half long; upper rather shorter, acute, lanceolate, slightly ovate, recurved at the point. *Flowers* mostly crowded into a level-topped panicle, with one or two below, in the forks of the branches, pale red, erect. *Calyx* scarcely more than half an inch long, ten-ribbed, smooth, pale, with purple teeth. *Petals* of a dull rose-colour, spreading, inversely heart-shaped, but rather oblong; their *crest* of two oblong, rounded, entire lobes. *Capful* roundish-ovate, on a short partial stalk.

S. orchidea. Orchis-flowered Catchfly. Linn. Suppl. 241. Willd. n. 46. Ait. n. 50. Sm. Fl. Græc. Sibth. t. 427, unpublished. (*S. Atocion*; Jacq. Hort. Vind. v. 3. 19. t. 32. *Lychnis græca, bellidis folio verna, flore parvo dilute purpurascens*; Tourn. Cor. 24.)—Downy, corymbose. *Calyx* cylindrical-club-shaped. *Petals* four-lobed; with a sharp two-lobed *crest*. Upper leaves ovate. Partial stalk as long as the *capful*.—Native of the Levant, flowering in May. Annual, of the size and habit of the last, but the herbage is of a grass-green, and finely hairy or downy, particularly the stem, the upper part of which is also viscid. *Leaves* broader, sometimes smooth in the

disk, though rough-edged. *Flowers* crowded and level-topped. *Calyx* an inch long, downy, often red. *Petals* rose-coloured, four-lobed like the lip of *Orchis militaris*, having two rounded central segments, and two narrower sharp lateral ones. The lobes of their *crest* are awl-shaped. The *crest* is not well distinguished in Jacquin's figure from the lateral lobes.

S. Armeria. Common, or Lobel's, Catchfly. Linn. Sp. Pl. 601. Willd. n. 46. Fl. Brit. n. 10. Engl. Bot. t. 1398. Fl. Dan. t. 559. (*Muscipula Lobelii*; Ger. Em. 601.)—Smooth, corymbose. *Calyx* cylindrical-club-shaped. *Petals* emarginate; with a sharp two-lobed *crest*. Upper leaves heart-shaped. Partial stalk as long as the *capful*.—Found in fields, and on banks, in various parts of Europe, but a doubtful native of England, though frequently cultivated as a hardy ornamental annual, flowering in summer. Dr. Sibthorp met with this species in Greece, and on mount Athos. In habit it agrees very much with the last, but is smooth, more glaucous, with broader leaves, and the *calyx* is not downy. The *petals* are simply obcordate, without lateral lobes. There is a brown glutinous ring under each joint of the stem, by which flies are caught.

S. italica. Italian Naked Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 1006. Fl. Græc. t. 429, unpublished. Ait. n. 6. (*Cucubalus italicus*; Linn. Sp. Pl. 593. Willd. Sp. Pl. v. 2. 686. Jacq. Obf. fasc. 4. 12. t. 97. not 79, as in Hort. Kew. and Willdenow.)—Panicle corymbose, spreading, somewhat three-forked. *Petals* in two deep narrow segments, without a *crest*. *Leaves* spatulate, rough.—Native of Italy and Greece. Cultivated by Miller. The *root* is biennial. *Herb* green, roughish with short rigid hairs. *Stem* solitary, herbaceous, erect, twelve or eighteen inches high, leafy, somewhat branched above, but chiefly at the base, from whence it sends out several, decumbent, leafy, purplish shoots, three or four inches long. Lower leaves stalked, spatulate or obovate; upper lanceolate; all thin and pliant, not fleshy. *Panicle* erect, rather slender, divaricated, more or less downy. *Calyx* an inch long, slightly swelling upward, with ten rough reddish ribs. *Petals* quite naked; their limb cloven nearly to the base, narrow, obtuse; white above; veined with purple underneath. *Capful* ovate, on a long stalk within the *calyx*.

S. catholica. Panicked Naked Catchfly. Ait. n. 10. (*Cucubalus catholicus*; Linn. Sp. Pl. 593. Willd. Sp. Pl. v. 2. 688. Jacq. Hort. Vind. v. 1. 23. t. 59.)—Panicle forked, much branched, widely spreading. *Petals* in two deep narrow segments, without a *crest*. *Calyx* obovate, smooth. *Leaves* ovato-lanceolate, nearly smooth.—Native of Italy and Sicily. Mentioned in Cupani's Hortus Catholicus, or Garden of the Prince of la Catolica, whence came the specific name; and not, as many suppose, from the plant being a native of Roman Catholic countries. The plant is perennial, of a tall slender habit, green, smooth, or slightly rough, with a large divaricated panicle, of numerous, small, white flowers, whose *calyx* is one-third of an inch long, often purple, obscurely ribbed. *Stamens* usually longer than the petals. *Capful* nearly globose, on a long stalk. We are not quite satisfied respecting *Viscago nocturna non viscosa, herbaceo flore*; Dill. Elth. 425. t. 316, considered by Linnæus as a variety of this, but it seems to be *S. saxatilis*, Ait. n. 28. Curt. Mag. t. 689.

S. mollissima. Velvet Naked Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 1007. Ait. n. 11. (*Cucubalus mollissimus*; Linn. Sp. Pl. 593. Willd. Sp. Pl. v. 2. 688.)—Panicle corymbose, somewhat three-forked. *Petals* rounded, cloven, without a *crest*. *Stem*, leaves, and *calyx* covered with

with soft down.—Native of the sea-coast of Italy. Gathered by Dr. Sibthorp in Asia Minor, between Smyrna and Prusa. We regret that he had not time to have a drawing taken of this rare and curious species, of which there is not, to our knowledge, any figure extant. Rand mentions the plant as cultivated at Chelsea, in 1739, and Linnæus had it at Upsal. The *stem* is branched, somewhat shrubby. Whole *herbage* clothed with velvet-like pubescence. *Leaves* crowded, spatulate, an inch and a half long, acute, slightly revolute. *Panicles* dense, level-topped. *Calyx* club-shaped, ten-ribbed. *Petals* white or reddish; their limb inversely heart-shaped. We find this plant mentioned in Mr. Donn's Cambridge catalogue, as introduced in 1804. If it exists in any garden, a figure ought to be published.

S. fruticosa. Shrubby Catchfly. Linn. Sp. Pl. 597. Willd. n. 14. Ait. n. 26. Sm. Fl. Græc. Sibth. t. 428, unpublished. (*Saponaria frutescens*, acutis foliis, ex Sicilia; Bocc. Sic. 58. t. 30. *Ocymoides fruticosum*; Camer. Hort. 109. t. 33, excellent.)—Panicle corymbose, close, somewhat three-forked. *Calyx* club-shaped, rough. *Petals* cloven; crest of four teeth. *Stem* shrubby. *Leaves* rough-edged.—Native of rocky situations, near the sea, in Sicily and Cyprus. It is supposed, on the authority of Parkinson's *Paradisus* 254. n. 10, to have been cultivated here in his time. The *stem* is woody, half an inch in diameter, with numerous tufted leafy branches, whose erect flowering extremities, about a span long, are more distantly furnished with smaller leaves, and are downy, viscid, and coloured in the upper part, each bearing a dense level-topped *panicle*, of ten or fifteen large *flowers*. *Leaves* recurved, spatulate, pointed, about an inch long, evergreen, smooth, and shining; the edges only being rough with minute, reflexed, rigid hairs. *Calyx* above an inch long, ten-ribbed. Limb of each *petal* of a long, inversely heart-shaped, form; pink above; veined with green beneath; their crest white, of two acute, somewhat notched, principal segments, and two sharp teeth at the base. In the *Prodr. Fl. Græc.* the figure of this plant is, by mistake, referred to *S. paradoxa*, which will be corrected in the *Flora* itself.

SECT. 4. *Stem panicled, scarcely forked.*

S. rigidula. Slender Rigid Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 1009. Fl. Græc. t. 430, unpublished.—*Stem* alternately branched, spreading. *Petals* in two deep sharpish lobes; each segment of their crest four-toothed. *Leaves* lanceolate, smooth.—Discovered by Dr. Sibthorp, on mount Hymettus, near Athens. The *root* is annual. *Stem* erect, a foot high, copiously branched from the very bottom, spreading, slender, purplish, viscid, but, like every other part, destitute of pubescence. *Leaves* green, narrow, few and remote, about an inch long; the lowermost longer and broader. *Petals* pale pink, veined with crimson. *Calyx* club-shaped, pale green, with ten red ribs, smooth, not an inch long. *Capsule* ovate, shorter than its stalk. A very pretty species, whose copious and delicate *flowers* would be an acquisition to our gardens.

S. spinescens. Thorny-branched Catchfly. Sm. Prodr. Fl. Græc. Sibth. 1010. Fl. Græc. t. 431, unpublished.—*Stem* shrubby, branches opposite, horizontal, becoming thorns. *Petals* deeply divided. *Leaves* spatulate, downy all over.—Found by Dr. Sibthorp in Asia Minor. The *stem* is thick and woody, very densely branched, leafy, downy, remarkable for its numerous, long, divaricated, lateral shoots, which finally harden into spines. The flowering *branches* are erect, a span high, each bearing a racemose, downy *panicle*, of pale-green *flowers*, veined under-

neath with brown, and, to judge by their aspect, doubtless fragrant at night. *Calyx* about an inch long, green, downy. The crest of each *petal* consists of two small, rounded, white lobes. *Capsule* ovate, twice the length of its stalk.

S. gigantea. Gigantic Catchfly. Linn. Sp. Pl. 598. Willd. n. 17. Ait. n. 29. Sm. Fl. Græc. Sibth. t. 432. (*Lychnis græca*, fedi arborescentis folio et facie; Walth. Hort. 32. t. 11.)—*Stem* erect, downy, and viscid. *Flowers* tufted. *Leaves* spatulate, villous. *Petals* in two rounded lobes. *Capsule* nearly globular.—Native of Crete and the islands of the Archipelago; Linnæus by mistake says of Africa. It has long been known in our more curious green-houses, and is esteemed for the sweet nocturnal perfume of its pale green flowers. The *plant*, though a yard high, and of a shrubby aspect, is only biennial. Radical *leaves* two inches long, copious, of a broad spatulate figure, more or less villous, light green, obtuse, with or without a small point. *Stem* straight, viscid; leafy, with several short *branches*, below; slightly branched above, but beset with dense, whorl-like, downy *panicles*, of numerous *flowers*. *Calyx* three-quarters of an inch long, club-shaped, downy. Limb of the *petals* divided more than half way, into two broad rounded lobes, veined beneath with purple; their crest cloven, very short. *Capsule* twice as long as its stalk.

S. congesta. Tufted Green Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 1012.—*Stem* somewhat branched. *Panicles* terminal, dense, many-flowered. *Petals* deeply divided, without a crest. *Leaves* spatulate, downy.—Gathered by Dr. Sibthorp in Greece; we believe on hills near Athens. The *root* is woody, evidently perennial, bearing many tufts of copious, spatulate, obtuse, green *leaves*, an inch and a half long, clothed, like the rest of the herbage, with dense, very short, pubescence. *Stems* erect, from nine inches to two feet high, scarcely leafy, bearing a few alternate branches, somewhat viscid at the top, where each terminates in a dense tufted *panicle* of greenish *flowers*, whose *calyx* is half an inch long, obovate, or club-shaped, and whose *petals* are cloven into two rounded lobes, without any crest. This species, of which we have no figure, is in some points allied to the last, but more akin, on the whole, to the following.

S. viridiflora. Panicled Green Catchfly. Linn. Sp. Pl. 597. Willd. n. 19. Ait. n. 31. (*Lychnis ocymastri* folio, flore viridi; Herm. Parad. 199, with a plate.)—*Stem* branched. *Panicles* elongated, loose, drooping, many-flowered. *Petals* divided half way; their crest of two linear lobes. *Leaves* elliptic-lanceolate, acute, downy.—Native of Portugal and Spain. The *root* is said, in Hort. Kew. to be biennial, though Hermann calls it perennial. *Stem* one and a half or two feet high, ending in a long loose *panicle* of drooping green *flowers*. *Leaves* two or three inches long, rough, like the rest of the herbage, with extremely minute tubercles, and more or less of short hoary hairs. *Flowers* like the last, but somewhat larger, and furnished with a crown, of which we can perceive no traces in *S. congesta*.

S. nutans. Nottingham Catchfly. Linn. Sp. Pl. 596. Willd. n. 11. Fl. Brit. n. 3. Engl. Bot. t. 465. Fl. Dan. t. 242. (*Lychnis fylvestris alba nona Clusii*; Ger. Em. 470.)—*Flower-stalks* panicled, drooping one way. *Petals* in two deep linear segments; their crest of two acute lobes. *Leaves* lanceolate, downy.—Native of dry limestone pastures or rocks, in various parts of Europe, flowering in June and July. It was first, in this kingdom, observed at Nottingham cattle, but grows also at Dover, and

SILENE.

various other places. The *root* is perennial, rather woody. *Stems* several, herbaceous, erect, a foot or more in height, downy; leafy below; racemose, in the first instance, above, the flower-branches shortish, turned to one side, downy and viscid, panicled, or imperfectly forked, each of three or four drooping white *flowers*, which expand in an evening. *Calyx* obovate, near three-quarters of an inch long, ten-ribbed, slightly downy. The lowest *leaves* are spatulate, on long stalks.

S. paradoxa. Soap-wort Catchfly. Linn. Sp. Pl. 1673. Willd. n. 13. Jacq. Hort. Vind. v. 3. 45. t. 84. (*Lychnis viscosa peregrina noctiflora odorata*; Zanon. It. 126. t. 50.)—Panicle racemose. Petals inversely heart-shaped; their crest of two acute lobes. *Calyx* downy. Leaves obovato-lanceolate, smooth.—Native of the south of Europe. Miller cultivated it for the Dover Catchfly, so that it requires a place in the *Hortus Kewensis*, though erroneously admitted into *Fl. Brit.* 467, as is explained at 1397 of the same work. What the older botanists found at Dover, and which may be seen in Petiver's and Buddle's collections in the British Museum, is still an undetermined plant. We greatly suspect, after all the confusion that has attended it, that this Dover Catchfly may be, as Mr. Hudson made it, the true *Cucubalus viscosus* of Linnæus, (see our next species but one,) a Swedish *Silene*, for which Tournefort's *Lychnis orientalis maxima, buglossi folio undulato*, figured in his Voyage, v. 2. 148, is erroneously quoted. Botanists of late have found nothing at Dover but *Silene nutans*, varying in size and hairiness. The true *S. paradoxa* is a nearly smooth plant, not very unlike *Saponaria officinalis* in flowers, but more slender in habit. The lower *leaves* are inclining to spatulate; the upper are linear-lanceolate. *Calyx* above an inch long, downy. *Petals* large, pale red.

S. longiflora. Long-smooth-flowered Catchfly. Ehrh. Beitr. v. 7. 144. Pl. Select. n. 75. Willd. n. 16. Ait. n. 27. "Waldst. et Kitaib. Hung. v. 1. t. 8." (*S. juncea*; Roth Catal. v. 1. 54. *Lychnis prælongis foliis et calyce*; Barrel. Ic. 63. t. 382.)—Panicle slender, racemose. Petals in two deep, rounded, divaricated segments; their crest of two acute lobes. Leaves linear-lanceolate, smooth, as well as the slightly ribbed calyx.—Barrelier says this plant grows in dry stony situations in Tuscany. There can be no doubt as to his synonym, though entirely overlooked by the German writers, who mention Hungary as the country of their plant. This is a tall, slender, elegant, perennial species, quite smooth, with a purple tinge on the *stem* and *calyx*. The latter is above an inch long, slender, nearly cylindrical, with ten obsolete ribs; its surface even and polished, without any pubescence. Claws of the *petals* longer than the calyx; their limb white, tinged externally with red. *Leaves* three or four inches long, half an inch broad, slightly glaucous; the radical ones numerous, on long stalks. This species bears a considerable affinity to *S. paradoxa*, but the long racemose *panicle*, and smooth even *calyx*, afford clear marks of distinction.

S. viscosa. Clammy Hairy Catchfly. Ait. n. 3. (*Cucubalus viscosus*; Linn. Sp. Pl. 592. *Fl. Suec.* ed. 2. 148. Willd. Sp. Pl. v. 2. 685. *Lychnis montana viscosa noctiflora hirsuta latifolia alba, floribus absque appendicibus*; Till. Pis. 105 ?)—Panicle simply racemose, hairy. Flowers opposite, longer than their stalks, drooping every way, without a crest. Stem simple, leafy. Lower leaves lanceolate, even, nearly smooth; upper downy, viscid; dilated and reflexed at the base.—Native of Scania and Finland, where it was gathered by Linnæus; and perhaps of Tuscany; as well as of our cliffs at Dover; see the last species but one. The Finland specimen, in the Linnæan herbarium,

is a foot high, with a rather stout, round, unbranched *stem*, leafy throughout, most downy and viscid in the upper part. Linnæus says the *root* is biennial. The three or four pair of lower *leaves* are two or three inches long, pointed, quite even and entire at the margin, nearly smooth, half or three-quarters of an inch wide; as many pair above them are gradually shorter, taper-pointed, even, scarcely wavy, both their surfaces viscid and densely downy, their base greatly dilated, ovate, or almost heart-shaped, clasping the stem. The solitary simple *panicle*, or rather *cluster*, about five inches long, consists of eight or ten pair of opposite solitary *flowers*, on short simple *stalks*, accompanied by small heart-shaped *bractæas*, altogether very hairy, and apparently viscid, as Linnæus describes them. He says the *flowers* are white, fragrant at night, and do not turn to one side, but droop in all directions. *Calyx* hardly an inch long, cylindrical, hairy, pale, with ten green ribs. *Petals* in two rather deep, somewhat rounded, segments, without a crest. *Capful* ovate, on a shortish stalk. We do not understand why Linnæus describes the *stalks* as three-flowered. We have no means of knowing whether this plant was cultivated by Miller in 1739; but by his having sent *S. paradoxa* to Linnæus for the Dover Catchfly, it is most probable that neither our *viscosa*, nor Tournefort's species next described, was ever in the English gardens.

S. buglossifolia. Bugloss-leaved Catchfly. (*Lychnis orientalis maxima, buglossi folio undulato*; Tourn. Cor. 23. Voy. v. 2. 148, with a figure.)—Panicle simply racemose, hairy. Flowers opposite, much longer than their stalks, erect, without a crest. Stem simple, leafy. Leaves undulated, hairy; the upper ones lanceolate.—Gathered by Tournefort at the foot of mount Ararat, flowering in the middle of August. By his description the *root* should seem perennial, as being divided at the crown into several parts. *Stems* several, a yard high, straight, firm, hollow, leafy, hairy and clammy, four lines in diameter. Lower *leaves* about five inches long, and one broad, ovato-lanceolate, acute, wavy and crisped at the edges, hairy, with a strong mid-rib and many veins; upper gradually smaller and narrower; the *bractæas* linear-lanceolate, mostly equal in length to the *calyx*, which is cylindrical, an inch long. *Petals* white, cut half way down, or more, into two rounded lobes, and apparently destitute of a crest; but Tournefort leaves that important circumstance unnoticed, while he minutely describes the green *germen*, and white *styles*. His plant, though referred by all authors to the preceding, is unquestionably distinct. We have compared specimens.

S. amoena. Tartarian Catchfly. Linn. Sp. Pl. 596, excluding all the synonyms, except Hort. Upf. 114. n. 11. Willd. n. 12. Ait. n. 25. (*S. procumbens*; Murray Comm. Gotting. v. 7. 81. t. 2 ?)—Panicle turned one way; the branches somewhat forked, hairy. Petals cloven half way down; their crests converging. Stem decumbent, alternately branched. Leaves lanceolate, nearly smooth.—Native of Tartary and Siberia. We doubt whether this species has ever been cultivated in England, the plant of Mr. Blackburne's catalogue, in 1779, having doubtless been our *S. maritima*, then universally taken for *amoena*. The latter is a spreading, branching, leafy, perennial species, with green *leaves*, an inch or two long, of which the upper ones are minutely downy. The *panicle* is two or three inches long, dense, with leafy lanceolate *bractæas*. *Calyx* pale green, with ten purplish ribs, obovate, finely hairy, rather more than half an inch long. *Petals* white.

S. regia. Splendid Catchfly. Sims in Curt. Mag. t. 1724.—Panicle erect, downy and viscid. Petals lanceolate, undivided, their crest of two acute lobes. *Calyx* angular, downy.

SILENE.

downy. Leaves ovato-lanceolate.—Found by Mr. Nuttall, growing wild, in great abundance, in the neighbourhood of St. Louis, on the Mississippi, North America, from whence seeds were communicated to A. B. Lambert, esq. who raised this fine plant in his garden at Boyton, Wilts. The *stem* is two or three feet high, somewhat angular. *Herbage* green, finely downy and viscid; at least in the upper part. *Panicle* racemose, partly forked, composed of about a dozen large *flowers*, conspicuous for the vivid scarlet of their long lanceolate *petals*, *filaments*, and *styles*. The *calyx* is above an inch in length, angular, ten-ribbed, slightly swelling upwards. The *petals* are said to be sometimes emarginate. We guess at their *crest* from the figure cited, which is not sufficiently explicit on this important point.

S. Otites. Spanish Catchfly. Fl. Brit. n. 7. Ait. n. 12. Prodr. Fl. Græc. n. 1014. (Cucubalus Otites; Linn. Sp. Pl. 594. Willd. Sp. Pl. v. 2. 688. Engl. Bot. t. 85. Fl. Dan. t. 518. Sefamoides salamanticum magnum; Ger. Em. 493.)—*Panicle* erect, much branched, tufted. *Flowers* dioecious. *Petals* linear, undivided, without a crest. *Leaves* spatulate, rough.—Native of dry gravelly open pastures throughout Europe, flowering in July and August. In England it chiefly occurs in the elevated champaign country of Cambridgeshire, Suffolk, and some parts of Norfolk, where its green panicles may easily be confounded with those of the accompanying grasses. The *root* is woody and perennial. *Stems* erect, two feet high, slightly leafy, very viscid in the middle part of their upper joints. *Leaves* copious about the root, about an inch in length, on very long stalks; in British specimens they are spatulate, clothed with minute curved pubescence; in Greek ones obovate, with longer hairs. The whole plant indeed varies greatly as to luxuriance, but we cannot discern a specific difference. *Flowers* small, with narrow pale yellow *petals*, and a purplish *calyx*. The *filaments* are usually imperfect, or obliterated, in all the flowers of one root, and the *pistils* in those of another; but occasionally both are perfect in the same. *Cap-sule* sessile, hardly bigger than a grain of wheat, splitting into six teeth.

S. linifolia. Flax-leaved Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 1015. Fl. Græc. t. 433, unpublished.—*Stems* panicled at the top. *Flowers* erect. *Petals* in two deep rounded lobes; their crest two-lobed, blunt. *Leaves* linear-lanceolate, rough.—Found by Dr. Sibthorp on mount Parnassus. The *root* is perennial, thick, woody, yellowish within, much divided at the summit. *Stems* numerous, about a foot high, erect, close, leafy, roughish, quite simple, except in the flowering part, very viscid between several of the upper joints. *Leaves* numerous, narrow, acute, above an inch long, minutely rough, of a glaucous green. *Flowers* erect, in close, irregular, slender panicles. *Calyx* green, smooth, not quite an inch in length, ten-ribbed. Limb of the *petals* flesh-coloured above; greenish, with purple veins, beneath. *Cap-sule* on a stalk as long as itself. These *flowers*, and those of the following, are probably fragrant at night.

S. staticifolia. Thrift-leaved Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 1016. Fl. Græc. t. 434, unpublished.—*Panicle* racemose, simple, close. *Flowers* erect. *Petals* in two deep rounded lobes; their crest two-lobed, blunt. *Leaves* linear-spatulate, acute, very smooth. *Cap-sule* shorter than its stalk.—Gathered by Dr. Sibthorp in Greece.—The *root* appears to be perennial, and somewhat creeping. *Stem* solitary, a foot high, slightly leafy, smooth, like every other part of the plant; the middle of its upper joint, below the inflorescence, viscid. *Radical leaves* numerous, stalked, narrow, glaucous, two inches long, including the stalks. *Flowers* few. *Calyx* club-shaped, an inch and a quarter

long, smooth, with ten purple ribs. Limb of the *petals* inflexed; white above; cinnamon-coloured beneath. The *stalk* supporting all the parts of the flower, within the *calyx*, is remarkable for its length, which nearly equals the *petals*, and exceeds the ripe *cap-sule*.

SECT. 5. *Stems* single-flowered.

S. auriculata. Auricled Mountain Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 1017. Fl. Græc. t. 435, unpublished.—*Stems* single-flowered. *Leaves* lanceolate, fringed. *Calyx* bell-shaped, downy. *Petals* cloven, auricled on each side at the base.—Gathered by Dr. Sibthorp, on the precipices of mount Delphi, in Negropont. The perennial *root* runs deep into the earth, and is crowned by numerous, dense, rose-like tufts, of bright green, ovato-lanceolate, sharp-pointed *leaves*, an inch long; smooth above; their cartilaginous edges fringed with white hairs. *Stems* solitary, erect, simple, downy and viscid, a finger's length, bearing two or three distant pairs of smaller leaves. *Flowers* erect, the size of *S. maritima*. *Calyx* swelling upwards; its veins and segments purplish. Limb of the *petals* deflexed, in two rather deep, oblong, rounded segments, furnished at the base with two very peculiar lateral appendages; their crest of two spreading lobes; their upper side white, tipped with pale purple; the under reticulated with purple veins. *Cap-sule* ovate, nearly thrice the length of its stalk.

S. falcata. Sickle-leaved Mountain Catchfly. Sm. Prodr. Fl. Græc. Sibth. n. 1018. Fl. Græc. t. 436, unpublished.—*Stems* single-flowered. *Leaves* awl-shaped, curved, hairy. *Calyx* club-shaped. *Petals* cloven; their claws wedge-shaped.—Gathered by Dr. Sibthorp, on the summit of the Bithynian Olympus. An elegant and remarkable species. The long perennial *root* resembles the last, except in being of a whiter colour. *Stems* very short, tufted, decumbent. *Leaves* crowded, sickle-shaped, about an inch long, rigid, rough with viscid hairs, three-ribbed, permanent, turning white with age. *Stems* ascending, a finger's length, purplish, hairy and viscid, slightly leafy. *Flowers* erect, cream-coloured, with a slender, rough, blood-red *calyx*, above an inch long. The *stalk*, bearing the parts of the flower within, is nearly equal to the *calyx* itself, and much longer than the ripe *cap-sule*. *Petals* with broad claws, dilated upward, and a crest of two bluntish lobes. *Germen* brownish below, with two crimson bands; green above.

S. Pumilio. Dwarf Mountain Catchfly or Champion. Wulf. in Jacq. Coll. v. 2. 126. t. 10. Jacq. Austr. append. 26. t. 2. Willd. n. 55. (Cucubalus Pumilio; Linn. Mant. 71. Caryophyllus sylvestris octavus; Clus. Hist. v. 1. 285. C. montanus Clusii; Ger. Em. 593. Betonica coronaria; Bauh. Hist. v. 3. 337.)—*Stems* single-flowered. *Radical leaves* linear-lanceolate, smooth. *Calyx* nearly cylindrical, hairy. *Petals* undivided; their crest bristle-shaped.—Native of the mountains of Carinthia, Moravia, and Italy, in a micaceous soil. A very handsome species. The *root* is perennial, crowned with dense tufts of grassy, or thrift-like, rather succulent *leaves*, about an inch long; among which are several, solitary, partly decumbent, simple *stems*, about twice that length, bearing a pair or two of smaller fringed leaves. The *flowers* are very large in proportion, rose-coloured, and, according to Arduino, who sent specimens to Linnæus, very fragrant, though Clusius and Wulfen describe them as without scent. The *calyx* is an inch long, slightly bell-shaped, reddish, densely clothed with soft whitish hairs. Limb of the *petals* rounded, wavy, but not lobed; their crest, overlooked by Arduino, of two erect slender crimson teeth, growing pale as the flower fades. *Germen* nearly or quite sessile.

S. acaulis. Moss Champion, or Catchfly. Linn. Sp. Pl.

Pl. 603. Willd. n. 56. Fl. Brit. n. 11. Engl. Bot. t. 1081. Lightf. 227. t. 12. f. 1. Fl. Dan. t. 21. Allion. Pedem. v. 2. 83. t. 79. f. 1. (S. exscapa; *ibid.* t. 79. f. 2. S. *elongata*; Bellardi Append. ad Fl. Pedem. 23. Cucubalus *acaulis*; Hudf. 187. *Lychnis alpina pumila*, folio gramineo; Bauh. Pin. 206. Dill. Elth. 206, with a plate. *Caryophyllus Pumilio alpinus*; Ger. Em. 593. *Ocimoide moscoso alpino*; Pon. Bald. 199.)—Stems very short. Leaves linear, smooth; fringed at the base. Stalks solitary, single-flowered, naked. Calyx smooth. Petals slightly emarginate; their crest minute, cloven.—Native of the highest mountains of Lapland, Scotland, Wales, Austria, Switzerland, France, and Italy, flowering in June and July. The perennial roots bear numerous, dense, moss-like tufts, of short leafy stems, so that the name *acaulis* is not strictly correct, when applied to this and some other alpine plants. Linnæus was doubtless aware of this, and used such an expression merely to contrast the plants in question with other evidently caulescent species of their own genus. The leaves are bright green, crowded, spreading, measuring from half an inch to an inch. Flower-stalks solitary, simple, slender, naked, smooth, very various in length, whence Allioni and Bellardi have exalted some trifling varieties to the rank of species. Flowers pink, with a violet calyx, much smaller than in the preceding, but very elegant. The crest is sometimes so small as to be easily overlooked. Capsule ovate, nearly sessile in its calyx.

We are persuaded that the capsule of this whole genus has properly six valves, or teeth, and that five are never justly attributed to it. We have not indeed had an opportunity of investigating every species, and even the accurate delineator of the *Flora Græca* having most generally exhibited only five of these parts, we cannot but hesitate, though on examining many specimens from which he made his drawings, we find six. A similar inaccuracy has crept into the history of the neighbouring genus *Arenaria*, upon which we may take some other opportunity of commenting.

SILENE, in *Gardening*, contains plants of the hardy herbaceous, and of the annual and perennial kinds, of which the species cultivated are, the common or Lobel's catchfly (*S. armeria*); the variegated catchfly (*S. quinquevulnera*); the pendulous catchfly (*S. pendula*); the Spanish catchfly (*S. muscipula*); the green-flowered catchfly (*S. viridiflora*); the Nottingham catchfly (*S. nutans*); and the shrubby catchfly (*S. fruticosa*).

In the first sort there are varieties with a bright purple flower, with a pale red, and with a white flower.

Method of Culture.—The annual and biennial sorts may be raised by seeds, which should be sown in the spring or autumn seasons, where the plants are to grow; but the latter is the better time. Some sow at both seasons, which may be a good practice. The seed should be put in in patches in the borders, clumps, &c. When the plants are up, they should be thinned to two or three plants in each clump, and be kept clean from weeds. With the biennial sorts it is sometimes the practice to sow them in beds; and when the plants are up, to remove them into nursery-rows till the autumn, when they are planted out in the borders, &c.

And the perennial sorts may likewise be increased from seeds, in the same manner; but the usual way is by slips of the heads, and parting the roots, planting them out in shady places, in the spring or early summer months. The shrubby sort may be increased by slips and cuttings of the branches or shoots, which should be planted out in similar situations, in the spring and summer seasons.

They all afford ornament and variety in the clumps and borders of pleasure-grounds.

SILENI, in *Ancient Geography*, a people of India, placed by Pliny in the vicinity of the river Indus.

SILENI, in *Antiquity*, a sort of heathen demigods, the same with satyrs, which were called *Sileni* when they came to be advanced in age.

Yet was there one principal Silenus, elder than any of the rest. Diod. Siculus says, he was the master or tutor of Bacchus, whom he disciplined nobly, and followed him to the wars. He quotes an ancient poet, named Thymætas, who relates, that the Sileni assisted Bacchus in the war he waged against the Titans; adding, that the first Silenus reigned in an island made by the river Triton, in Lybia.

He is represented as having a long tail hanging behind, which is likewise an attribute of all his posterity. The poets always mount him on an ass, always drunk, and hardly able to support himself; "titubantem annisque meroque," as Ovid (*Met.* l. v.) speaks. Upon all the antiquities that represent him, he has the air of a drunken man dozing over his wine; and when Virgil, in one of his Eclogues, describes him, it is like a man gorged with wine as usual:

"Inflatum hesterno venas ut semper saccho."

Ancient authors, however, who are very worthy of credit, express more favourable sentiments of him. Silenus, according to their account, was a profound philosopher, whose wisdom was equal to his knowledge; and the drunkenness so often mentioned was merely mythical, signifying that he was profoundly immersed in speculation. Cicero, Plutarch, and many others, had formed the same idea of Silenus, and always regarded him as a very ingenious man, and a great philosopher. Accordingly Virgil, in his second eclogue, puts into his mouth the principles of the Epicurean philosophy, about the formation of the world, and the beings that compose it:

"Namque canebat uti," &c.

Midas, having heard of the extraordinary talents of Silenus, wished for an opportunity of conversing with him. Silenus, who rambled about the country upon his ass, frequently reposed near a fountain, which Midas supplied with wine; and here Midas found him, and treated him with great respect. In consequence of this intercourse, Midas availed himself of the counsels of Silenus, in founding his laws and religious ceremonies. See MIDAS.

A passage in Diogenes Laertius is said to explain the fable of Silenus's riding on an ass; for in comparing Aristotle to Silenus, he says, the first was always on horseback, and the second rode upon an ass: the meaning of which is, that he made only slow, but sure, advances in philosophy; whereas the other moved at a quick pace, and now and then made a trip. The fable of the ass's ears, according to Terullian (*l.* ii. de Anima), informs us, that he was endued with great intelligence. Vossius (*de Idol.* l. ii.) explains that of the fountain of wine, by saying that it signified only the desire that Midas had to get Silenus into his possession, who, according to him, was king of Caria, and actually became a great friend to Silenus. He is represented as distinguished for his skill in music. He is said, not only to have invented musical instruments, but to have had the courage, like Marsyas, to challenge even Apollo himself to a trial of skill. Herodotus, speaking of Marsyas, calls him Silenus, l. vii. c. 26.

Nonnus makes Silenus a son of Tellus; and gives him

three sons, Astræus, Maron, and Lenæus. Servius, on Virgil's Eclogue, makes Silenus the son of Mercury; others, the son of Pan and a nymph; others will have him born of the drops of the blood of Cælus, the father of Saturn.

Ælian (Var. Hist. l. iii. c. 12.) alleges that Silenus was born of a nymph, and that though he was not of the number of the gods, he was, however, of a nature superior to that of man. Silenus is said to have been born at Malea, or at least brought up there, according to the testimony of Pindar, who thus speaks: "Silenus, that incomparable dancer, when a citizen of Malea, the happy spouse of fair Nais had the good fortune to educate." Lucian describes Silenus as of a middle size, fat and plump; and thus he is represented upon medals, and other monuments now remaining.

Bochart, in his "Canaan," will have Silenus to take his name from שִׁלֵּן, or שִׁילֵן, *Silo*, the name of the Messiah, whence שִׁילֵן, *Silan*. He also adds, that all that is attributed to this imaginary deity is taken from what the prophets have foretold of Jesus Christ. Thus, whereas it is said, the Messiah shall be the instructor of the people; Silenus is made the preceptor of Bacchus. Because it was said, that our Saviour should bind his ass to the vine, and his colt to the young vine; Silenus is made to ride on an ass. Because our Saviour washed his garments in blood, as those that trod the wine-press; Silenus was made to preside over those who pressed the vintage. Because it is added, his eyes were red by reason of wine; Silenus was made always fuddled. Bochart, however, advances all this with a great deal of distrust, as he has reason, it having no warrant. He adds, that the devil invented the fable of Silenus, to turn the mysteries of our religion into ridicule. But the sense which he has given to the words, *rubent oculi ex vino, & dentes ejus ex lacte albescent*, is very forced and unnatural; as if the words signified any thing more, in the propriety of the Hebrew tongue, than, his eyes are redder than wine, his teeth whiter than milk. We may add, that nobody, before Bochart, neither Christian nor idolator, ever saw any thing of Jesus Christ in the fable of Silenus.

Silenus was worshipped after his death as a demigod, and received the honours due to heroes, independently even of Bacchus. Thus Pausanias speaks (in Eliac.), who, mentioning the temple which Silenus had in Elis, expresses himself in these words: "There you will likewise see a temple of Silenus, but a temple which is appropriated and peculiar to himself, while Bacchus has no share in the honour of it."

SILENTIARY, SILENTIARIUS, an officer among the ancient Roman slaves; being, according to some authors, a slave placed over the rest, to prevent any noise and uproar, and to keep them silent.

Seneca, in his Epistles, mentioning the great care taken to keep the slaves mute, has given occasion to Lipsius, Pompa, and some others, to suppose, that the silentary was established in his time: but others, as Pignorius, think no such conclusion can be drawn from Seneca's words; nor any thing, but that they were, even then, very severe in preventing any noise among the slaves. As to the name and office of the silentary, it was not established till about the time of Salvian, who is the first author that mentions it.

There were also silentarii established in the emperor's court, called *quietis ministri*, and *silentarii palatii*; and honoured with the farther titles of *clarissimi*, *speciabiles*, *devotissimi*, and in Greek *σαυμασιωτατοι*, *q. d. most admirable*.

There were a great number of these; but only thirty ordinarily officiated, who were divided into three bands,

each of which had its decurio! The council of Chalcedon call the body of silentaries, *schola devotissimorum silentiariorum*.

SILER, in *Botany*, a Latin name in Virgil, supposed to belong to some slender kind of willow, or osier. It is used vaguely, by the earlier botanists, for different umbelliferous plants, and retained by Gartner, after Rivinus, for *Laserpitium trilobum* and *aquilegifolium*, which those writers place in a genus by themselves. Linnæus uses the above word, as the specific appellation of another LASERPITIUM. See that article.

SILESIA, *Duchy of*, in *Geography*, a country of Europe, bounded on the N. by the marquisate of Brandenburg, on the E. by the duchy of Warsaw and Austrian Poland, on the S. by Hungary, from which it is separated by a chain of mountains, and a wilderness or thicket, about four miles broad, and on the W. by Moravia, Lusatia, and Bohemia. To the W. and S. Silesia is environed by a chain of hills, being with respect to extent and height some of the most remarkable in all Europe. (See *SUDETIC Chain*.) For other mountains of Silesia, and their productions, see PRUSSIA. In the mountains of this province, and in that part of it that lies towards Moravia and Hungary, the winter is earlier and of longer continuance, and much more severe, than in the more level territories. During those months, in which at the foot of the Riesengebirge and the Giesenk every thing is covered with ice and snow, the trees at Breslau are in full verdure even in winter. The sandy parts of the principality of Glogau, and beyond the Oder, towards Poland, with the mountainous tracts, which are of considerable extent, produce but little, nor is their grain sufficient for the consumption of the inhabitants. But this deficiency is compensated, in favourable seasons, by the fertility of the other and larger part of Silesia, which, besides wheat, rye, barley, and oats, yields likewise maize or Turkey-wheat, spelt, buck-wheat, millet, linseed, pease, and beans. The culinary vegetables about Breslau, Brieg, Neisse, Frankenstein, and Lignitz, are excellent: and the vicinity of Grunberg and Lower Beuthen affords plenty of fine fruits. Those spots that are not fit for tillage afford good pasture-grounds, or are covered with wood. Of flax there is abundance, but hemp in less plenty, which is supplied by importation from Hungary and Poland. Hops principally abound near Munsterberg. Madder forms one of the principal articles of export. A yellow dye, called *scharte*, is plentiful; nor is this country deficient in tobacco plantations; but its saffron is of an indifferent quality. The wine of the country is good, more especially after it has been kept for some years in the cellar. In the mountains and Upper Silesia, tar, pitch, and resin, are made from the pine and fir, and the larch-tree produces turpentine. From these resinous trees, and the trunks of the coarser pines, the inhabitants of the mountains make a lamp-black. Terra sigillata is found in many places, and particularly near Strigau; but it is used not as an article of the materia medica, but principally in the manufacture of earthenware. Cattle are reared merely for the plough, and for the necessary supply of milk, butter, and cheese; but the markets are furnished, particularly with oxen, from Poland and Hungary. The most noted markets are those of Brieg, Breslau, and Schweidnitz. Although the studs in this country afford many fine and stout horses, the number is not sufficient: and therefore, besides those that are purchased at Frankfort fair, great numbers are brought hither from Lithuania. The inhabitants of the hilly districts keep goats, and cheese in great quantity is made from their milk. The breed of sheep is considerable and

and lucrative, on account of the excellent quality of their wool. The wild beasts of this country, whose skins are valuable, are lynxes, foxes, weasels, otters, and beavers. The Oder furnishes salmon and sturgeon, skate, lampreys, &c. The other rivers, as well as the lakes and ponds, abound in various kinds of fish, such as pike, carp, trout, mullets, &c. Bees are bred for a supply of wax and honey, but their commodities are not in sufficient quantity to supersede the necessity of importation from Poland. Silk is in a state of increasing cultivation. The principal manufactures of Silesia are those of thread, twine, linen, flax, and damask. The chief exports are madder, mill-stones, thread, yarn, linen, wool, and woollen cloth, together with stuffs and paper. Under the dominion of the king of Prussia the commerce of Silesia has been considerably improved.

The prevalent religion in Silesia, as well as in Prussia, is the Protestant; and the bishoprics here, as well as in Poland, retain their ancient limits, while the power of the prelates is much abridged.

The manners and customs of the inhabitants of this province resemble those of their neighbours the Bohemians; but those of both these races have been so much melted down into that of the Germans, that the peculiar features are minute and unimportant. Silesia has some pretensions to literary fame. The capital of Silesia is Breslau; besides which there are only three towns which contain more than 600 inhabitants, *viz.* Glogau, Hirschberg, and Schweidnitz. For other particulars, see PRUSSIA.

Silesia affords few materials for history. Its ancient inhabitants were the Lygii and Quadi; but about the middle of the sixth century, the Slavi having overrun the country of the latter, a part of it was annexed to Poland, and called "Zlezia." Under the Polish sovereigns, Silesia received the Polish language, manners, and usages, with the Christian religion. After having been a Slavonic province of the Polish dominion, it was seized, in the 14th century, by John of Luxemburg, king of Bohemia (February, 1339), and passed with that sovereignty to the house of Austria. On the death of the emperor Charles VI. in 1740, Frederick II. king of Prussia, laid claim to the principalities of Lignitz, Brieg, and Wohlau; and his claims were so effectually supported by the march of an army into Silesia, that Maria Theresa, daughter and heiress of the emperor Charles VI. and queen of Hungary and Bohemia, by a preliminary treaty at Breslau, which was soon followed by a ratification of the same at the peace of Berlin, did, on behalf of herself, her heirs and successors, of both sexes, for ever cede to the king of Prussia, and his heirs and successors, of both sexes, with entire sovereignty and independency of the crown of Bohemia, the countries of Upper and Lower Silesia, together with the district of Katscher, formerly belonging to Moravia, as also the county of Glatz; reserving, however, to herself the principality of Teschen, with the lordships annexed thereto, the part of the principalities of Troppau and Jagerndorf, beyond the Oppa, the part of the principality of Neisse bordering on Moravia, and a small district belonging to Moravia, with some frontier towns. Silesia was never immediately connected with the empire, having at no time been an imperial fief, nor obtained a seat or vote in the diet. Neither has it been ever subject to the supreme tribunals of the empire, so that here the imperial laws are of no force. This event happened in 1742. The king of Prussia having obtained the greater part of this country with entire sovereignty, and absolutely independent of the crown of Bohemia, governs it accordingly, as a state absolutely free and divested of the least connection with the empire: but in the year 1751, the empire becoming a guarantee to his Prussian

majesty for the secure possession of the duchy of Silesia, a proviso was made for its rights consequential to such an engagement. Ever since the close of the twelfth century, Silesia has been divided into the Upper and Lower, and this division is still in use. Lower Silesia contains thirteen principalities, the names of which are as follow; *viz.* Breslau, Brieg, Glogau, Jauer, Lignitz, Munsterberg, Glatz, Neisse, Oels, Sagan, Schweidnitz, Wohlau, Trachenberg, and Carolath; the free standesherrschasts or lordships of Wartenberg, Militsch, and Gofschutz; and many minderherrschasts or inferior lordships. To Upper Silesia belong the six principalities of Teschen, Troppau, Jagerndorf, Oppeln, Ratibor, and Bilitz, the free standesherrschasts of Pleß and Beuthen, and certain minderherrschasts. At present under two sovereigns, the capital divisions must necessarily be into that of Prussian and Bohemian. Breslau is the capital of Prussian Silesia. The regency of Bohemian Silesia is erected at Troppau. The whole country is said to contain 180 cities and towns, 4000 villages, and 1,890,000 inhabitants. For other accounts of the population, see PRUSSIA.

SILESIACA TERRA. See TERRA.

SILEX, *Kieselerde*, Germ., in *Mineralogy*, a species of earth which is generally found in a stony state, and from its forming nearly the whole composition of flint, it has acquired the name of filix, or siliceous earth. It is found in equal or perhaps greater purity in rock-crystal and quartz, and in white sand; and it is probably an earth that most abounds on the globe. Most of the stony combinations of filix are remarkable for their hardness, and will very readily strike fire with steel. Silix, when pure, is white, and perfectly void of taste and smell; it is insoluble in water, and incapable of artificial crystallization. For its other properties, see FLINT and SILICA.

SILHET, in *Geography*, a circar of Hindoostan, in the N.E. part of Bengal, bounded on the N. by Bootan, and on the E. by Meckley, and elsewhere by a part of Bengal.—Also, a town of Hindoostan, and capital of a circar, to which it gives name; 106 miles N.E. of Dacca. 'N. lat. 24° 52'. E. long. 91° 57'.

SILI, in *Botany*, a name given by the old Greeks to a plant called also *seseli*.

SILJAN, in *Geography*, a town of Sweden, in Dalecarlia, on a lake to which it gives name; 25 miles N.W. of Fahlun.

SILICA, in *Ancient Geography*, a town of Africa, in Interior Libya, near the river Bagradas. Ptolemy.

SILICA, in *Mineralogy* and *Chemistry*. In the former it is an earthy substance, existing abundantly in the composition of the globe, and forms a distinct genus of minerals in such as it predominates. In chemistry it was formerly considered as a simple body, under the class of earths. In the present state of chemistry it is regarded as a metal combined with oxygen, and belongs to one of the most extensive classes of compounds in chemistry.

The minerals in which it is principally found are rock-crystal, quartz, agates, and flints. The first of these almost wholly consists of silica. In order, however, to obtain it in perfect purity, let the rock-crystal, or quartz, be heated red-hot, and then plunged into cold water. This has the effect of lessening its aggregation. To facilitate its reduction into powder, let one part of this powder be fused in a silver crucible, with three parts of pure potash. The fused mass will be found soluble in pure water. To the clear solution add any acid sufficient to saturate the alkali, but not more. A gelatinous precipitate will be found, which, when well washed, dried, and heated to ignition, in a silver crucible, will be pure silica.

It is a fine white powder, harsh to the touch, and destitute of taste or smell. Its specific gravity is 2.6.

Silica is not acted upon by the air, nor changed by moisture. When strictly pure, no ordinary heat will fuse it. It does however put on appearances of fusion, when heated by the aid of a blowpipe and oxygen gas. It does not combine with oxygen, sulphur, phosphorus, carbon, or azote.

The two fixed alkalies do not affect it in the cold, but when fused with it in a silver crucible they combine, forming compounds, which have all the appearance of glasses. Indeed, when the two bodies are in one proportion, they form the purest and most perfect glasses. When the alkali is to the silica as three to one, the compound is soluble in water. This solution has been called the *liquor of flints*. Any of the acids are capable of combining with the alkali, and precipitating the silica in a state of purity, as we have before observed in the process for obtaining silica.

If an excess of acid be added to the solution, part of the silica is dissolved. This is more especially the case with the muriatic acid. A very dilute solution of silica in potash, in a vessel covered with paper, was left at rest by professor Seigling for eight years. Crystals of silica were found in the fluid, and the surface had a transparent crust upon it, strong enough to allow the vessel to be inverted without spilling the liquid. Some of the crystals were found to be pure silica, in groups of tetrahedral pyramids. There were also crystals of sulphate and carbonate of potash. The former were so hard as to strike fire with steel.

When fluoric acid is distilled from a glass vessel, or from any other substance containing silica, this acid assumes a complete gaseous form. The moment it is absorbed by water, a proportion of silica is precipitated. In this case, the gas which comes over is a compound of silica and the acid, which may be called fluat of silica. The liquid acid is also found to hold silica in solution. It was from this solution, after standing two years, that Bergman obtained crystals of pure silica. They were of a cubic form, with three angles truncated. They were not so hard as rock-crystal.

The boracic and phosphoric acids have no action upon silica in the cold, but unite with it by fusion, forming transparent vitreous substances.

Silica does not combine with any of the metals, but it combines with many of their oxyds, forming compounds, which are called glasses, enamels, or porcelains, according to their appearance.

With the oxyd of lead it forms the glazing of common pottery; with oxyd of iron, a dark green or black glass.

We have already spoken of its combination with the alkalies which belong to this class of compounds.

When a solution of lime or barytes in water is added to a solution of silicated potash, or liquor of flint, those earths become precipitated, forming a peculiar compound.

A similar combination takes place when a solution of silica in potash is added to a solution of alumine in the same alkali.

Although the fusibility of silica is impracticable at the heat of our hottest furnaces, yet its combination with other earths is fusible, though at a very high temperature. Equal parts of lime and silica fuse into a mass between porcelain and enamel at 150° of Wedgwood. We hence see the use of lime in smelting iron ores which abound with flint.

Silica appears to be the most abundant of the earths, forming the greatest proportion of the primitive rocks, and the basis of the terrestrial globe.

Although it has not been directly proved to be a metallic oxyd, there is the most presumptive reason for thinking it so. From the small action which acids had upon it, compared with the other earths, sir Humphrey Davy at first suspected it to be an earth already combined with an acid, and made some attempts, by the aid of Galvanism, to verify this idea, but without success. He fused silica with iron by the Galvanic battery, and obtained a mass which afforded silica when dissolved by an acid with water. He also heated silica to whiteness, and on bringing potassium in contact, a compound was formed of silica and potash, but a number of black particles were diffused through the mass, which sir Humphrey Davy thought were conductors of electricity. They did not act upon water; but when an acid was added, an effervescence took place. They also burnt in a strong heat, affording a white substance, which had the characters of silica.

Little is known of the proportions in which silica combines with other bodies. Dalton gives its atom as forty-five times heavier than hydrogen: and sir Humphrey Davy states the number for silica at sixty-one, which, reduced to Dalton's standard, would be 30.5. But neither of these is to be depended upon.

SILICEOUS, in *Mineralogy*, denotes composed principally of flint.

SILICEOUS *Schistus*, in *Mineralogy* and *Geology*, the hornstone slate of some geologists; flinty slate of Jameson; a rock of the nature of slate, but containing a great portion of siliceous earth. It frequently occurs in beds in clay-slate, and sometimes forms entire mountains, which are either homogeneous or porphyritic, containing crystals of felspar, and forming porphyritic flinty slate. The colour consists of various shades of grey, but it is sometimes red, approaching the nature and colour of jasper. It is generally traversed by veins of quartz, but rarely, if ever, contains metallic veins. It is extremely hard, and breaks with difficulty; the fragments are sharp-edged, and more or less translucent in minute portions. The Lydian stone, which is used as a test, or touch-stone, for determining the purity of metals, is nearly allied to siliceous schistus. This rock passes, by gradation, into clay-slate; and when the flint predominates, into hornstone or chert.

SILICEOUS *Earth*, in *Agriculture*, such as is constituted of siliceous materials.

SILICEOUS *Marle*, that which is of a sandy or siliceous nature. See MARLE.

SILICERNIUM, among the *Romans*, a funeral supper, which is otherwise called *exequium*.

SILICIATE, in *Mineralogy*, a term lately introduced by professor Berzelius, to denote the combination of flint with other earths or oxyds, in which the flint is supposed to act as an acid. These substances he denominates silicates. As this view of the action of flint tends to throw considerable light on various processes in the mineral kingdom, it is but justice to our own countryman, Mr. Hume, a respectable scientific and practicable chemist in London, to state, that so early as 1805, he had, in Mr. Park's Chemical Catechism, asserted the action of flint as an acidifying principle, and subsequently in the Philosophical Magazine for 1808, he distinctly and perspicuously described various processes, both natural and artificial, in which flint performed the part of an acid; this he attributed to the great proportion of oxygen contained in it. As flint is by far the most abundant substance in the composition of the globe, either pure or in combination with the other earths, its peculiar properties, and the part which it performs in the successive changes that take place in the mineral kingdom, are a sub-

ject of much interest both to the geologist and the chemical philosopher. The similarity of its effects with those of oxygen and acids, have been pointed out in a very striking manner by Mr. Hume in the paper before referred to.

There is a remarkable similitude in the effects of oxygen and silicic acid on the metals, particularly in that process called vitrification, which is, in every meaning of the word, a complete saturation and oxydation. By means of silicic acid, all the metals (perhaps without exception), from being the most opaque bodies in the universe, may be rendered quite pellucid, affording an endless variety of the most charming tints. It is chiefly from metallic substances that the most durable colours are obtained, particularly for staining glass, and making artificial gems. The best opaque colours, such as are most suitable for enamel, water, oil, crayon, and all other descriptions of painting, are derived also from the metals combined either with silicic acid or oxygen. Even the precious stones, and the less valuable crystals and pebbles, with an infinite number of mineral productions, seem to derive their beauty and value from the action of silicic acid on the metals. Thus, the opacity of lead is effectually changed by the sand or silicic acid used in the composition of flint-glass, and the compound is rendered not less diaphanous, than when, by means of oxygen, the same metal is dissolved in dilute nitric acids.

The power which silicic acid exercises over potash and soda, and a variety of other substances which enter into the composition of glass, is a striking and well-known instance (says Mr. Hume) of its neutralizing efficacy; for no acid more completely obtunds the acrimony of alkaline bodies, and disarms them of their corrosive character. The effervescence which results when silicic acid and the alkali enter into fusion and form this tasteless compound, is not observable till the materials are on the point of perfect combination; hence, as something is apparently evolved, neither oxygen nor any other aeriform fluid can be supposed to enter; so that the acidifying power (if the term may be applied) which appears to coerce the alkaline matter, is alone due to the sand which is usually employed to form glass. Indeed vitrification seems, in all instances, to be accomplished by silicic acid, or by oxygen, and the glass of lead, of antimony, of phosphorus, borax, or any other body, is due to the one, as much as the glass in common use is to the other of these oxygenating agents.

The power of silicic acid, as an oxydizing, saturating, and neutralizing agent, is by no means confined to rocks, minerals, and the inanimate parts of created matter; but it pervades also, as an essential element, the structure of organized beings, and occupies a distinguished place both in the animal and vegetable economy. "Nothing is more astonishing," says Dr. Smith, "than the secretion of stony earth by plants, a fact which is well ascertained." According to modern experiments, human hair, and probably the hair of all animals whatever, also contains silicic acid as a constituent element.

From numberless phenomena that admit of no other interpretation, it may justly be inferred, says Mr. Hume, that nature possesses means of converting silicic acid into other forms, and of so interweaving it into the constitution of her varied works, that it ceases entirely to appear in its original state. Every thing connected with the progress of animal and vegetable existence, with the inscrutable secrets of the assimilating powers, or with the physiology of all organized matter, shews that transmutation is an operation which we cannot disprove, though we may not be able to trace it through all its steps.

According to Berzelius, silicic acid, or silica, considered as an

acid, possesses the property of giving silicates of many different degrees of saturation. The most general is that in which silicic acid contains the same quantity of oxygen as the base: these he denominates simply *silicates*. The next most general are those in which silicic acid contains three times the oxygen of the base; these he calls *trisilicates*: it not unfrequently contains twice the oxygen of the base; these combinations he calls *bisilicates*. Silicic acid produces a great number of combinations with excess of base of different degrees, which he denominates *subsilicates*, to which again he applies the appellations *bi*, *tri*; for example, *bialuminous subsilicate*, *trialuminous*, &c. all announcing that the base contains twice or three times the oxygen of the silicic acid.

Silicic acid, like other acids, gives also double silicates, partly with and partly without water of crystallization. We most frequently find, that the bases which have a tendency to produce double salts with other acids, do the same thing here: in the same manner, as in the double silicates, we again find (although with many exceptions) the same proportion between the bases as in the other previously known salts with double bases. Hence, for example, if in common felspar we could exchange silicic acid for sulphur, the combination would be alum without water.

But Nature in her rich stores, says Berzelius, exhibits a number of combinations of silicic acid still more various, for which we have few if any analogous combinations to produce from the experiments in our laboratories. Thus we find silicates with from three to four bases, which all form one common combination, whose pure crystalline structure seems to render it evident that it must be considered as one chemical whole; unless it should hereafter be proved that such bodies belong to the class of crystals that are formed of many different substances lying in juxtaposition, but not chemically combined.

It often happens, also, that these numerous silicates are not of the same degree of saturation, but that one or more of the weaker bases are subsilicates, or silicates, while one or more of the stronger are *bi* or *tri*-silicates. That similar combinations are not formed in our laboratories, arises evidently from the rapid and violent means by which these combinations are effected, which will not admit the action or influence of those weaker affinities which take place in the secret and undisturbed recesses of the mineral kingdom. As it is of importance to ascertain the quantity of oxygen in silicic acid, in order to determine its proportions in the different combinations of silicates, Berzelius, from various experiments made by himself and others, estimates the proportion of oxygen to be 49.64. See SILEX.

SILICULA, in *Botany*, the diminutive of **SILIQUA**, (see that article,) is a Pouch, or pod of a short, or rounded, figure, along both the edges of whose partition the seeds are inserted; witness the *Draba verna*, or Whitlow-grass, so common on walls in the spring, and the *Thlaspi Bursa-pastoris*, Shepherd's purse. The partition is always really parallel to the valves, though the latter are often so protuberant, as in the *Thlaspi*, that their depth is much greater than the real diameter of the fruit. Hence Linnæus has fallen into an error, first detected by Mr. Brown, in the character of **SUBULARIA**. See that article.

SILICULOSA, the first of the two orders of the 15th class in the Linnæan system, **TETRADYNAMIA**, (see that article,) the character of which order consists in the short, or rounded, not oblong, form of the seed-vessel. See **SILICULA**.

SILIFREY, in *Geography*, a town of Africa, in the kingdom of Barra.

SILILICON, in *Botany*, a name given by some of the old

old Latin writers to the carob tree, *fliqua dulcis*. The Latins borrowed this name from the Greek *xyloglycon*, *ξύλογλυκον*, the sweet, or sweet-fruited tree.

Isidore mispels the word *fillicon*, and making it only *fili-con*, supposes it to be a barbarous way of spelling the word *filiqua*; but the evident derivation of the genuine word from the Greek, shews his error both as to the word itself, and the origin of it.

SILIN, or ABU AIT, in *Geography*, a town of Egypt; 12 miles S.S.E. of Siut.

SILINDIUM, in *Ancient Geography*, a small town of Asia Minor, in the Troade, near mount Ida.

SI-LING, in *Geography*, a town of China, of the third rank, in Quang-li; 20 miles S. of Si-long.

SILINO, a small island among the Philippines, near the north coast of Mindanao. N. lat. $9^{\circ} 2'$. E. long. $121^{\circ} 40'$.

SILINUS, in *Ancient Geography*, a river of the Peloponnese, in the Elide, which watered the territory of the Scillunte, according to Pausanias.

SILIPICA, in *Geography*, a town of South America, in the province of Cordova; 20 miles S. of St. Jago del Estero.

SILIQUA, *σιλίκιον*, among the ancients, the third part of an obolus, or, what comes to the same, the sixth part of a scruple.

SILIQUA *Nabathæa*. See NABATHÆA *Siliqua*.

SILIQUA, in *Botany*, a Pod, is a sort of PERICARP. (See that article.) The *Siliqua* is a solitary seed-vessel, of an elongated form, and dry substance, consisting of two parallel valves, separated by a parallel linear partition, or receptacle, along each of whose edges the seeds are ranged in alternate order. Examples are found in the Cruciform plants, constituting the Linnæan class *Tetradynamia*, such as *Cheiranthus*, the Stock or Wall-flower; as also in *Chelidonium*, the Celandine; and *Bignonia echinata*, Gærtn. t. 52. f. 1. This kind of seed-vessel differs from a LEGUME, (see that article,) in having the seeds inserted along each of its margins.

SILIQUA. See CAROB.

SILICUASTRUM, the appellation of the Judas-tree in Tournefort and preceding authors, alluding to its partial resemblance to the fruit of the Carob, which was called *Siliqua*, the Pod, by way of eminence. See CERATONIA and CERCIS.

SILICUASTRUM, in *Natural History*, the name given by Mr. Lhuyd, and others, to the bony palates of fishes, when found fossil. See ICHTHYPERIA.

SILICUATICUM, among the Romans, a custom or toll paid for merchandize. This the Greeks called *ceratizismus*.

SILICUOSA, in *Botany*, the second order of the Linnæan 15th class, *Tetradynamia*; which order is characterized by the oblong form of the seed-vessel. See SILIQUA and SILICULA.

SILICUOSÆ, the 39th natural order, among the *fragmenta* of Linnæus, exactly analogous to the CRUCIFERÆ of Jussieu. See that article, as well as, hereafter, TETRADYNAMIA.

SILIS, in *Ancient Geography*, a river of Italy, in Venetia, which had its source in mountains called Tauriniani.

SILISTENI, in *Geography*, a town of Moldavia; 10 miles S.W. of Huff.

SILISTRIA. See DRISTRA.

SILIVRIA, or KILLEEVER, a large and populous town on the sea of Marmora, once well fortified, and still

in part surrounded by a strong wall. Some of its mosques and minarets are very handsome buildings. The lower part of the town is washed by the sea. Its bay is capable of accommodating a considerable number of vessels, and is so well sheltered by the high land on each side of it, that ships may, in any weather, ride in safety.

SILIUS ITALICUS, CAIUS, in *Biography*, an Italian poet, was born about the year 15 of the Christian era. He has been supposed to have been a native of Italica in Spain; but his not being claimed as a fellow countryman by Martial, who has bestowed upon him the highest praises, renders the supposition improbable. It is certain that he lived chiefly in Italy, in which he possessed several estates. The knowledge of him come down to these times is derived from a letter of Pliny the Younger to Caninius Rufus, announcing his death. From this it appears that he incurred some reproach in the reign of Nero, as having been forward in accusations, and that he was consul at the time of the tyrant's death; that he made a discreet and humane use of the friendship of Vitellius; and that having acquired much honour, from his conduct in the proconsulate of Asia, he thenceforth withdrew from public offices, and maintained the rank of the principal persons of the city without power, and without envy. It appears, likewise, that he passed his time chiefly in literary conversations, and in composing verses, which he sometimes recited in public. He had great taste for elegance, and purchased a number of villas, which, after enjoying for a time, he deserted for new ones. He collected a number of statues, books, and busts, to some of the latter of which he paid a kind of religious veneration. This was particularly the case with respect to that of Virgil, whose birth-day he kept with much more ceremony than his own, and whose tomb was included in one of his villas. He is said also to have possessed a villa that had been Cicero's. In his latter years he retired altogether to his seat in Campania, which he did not quit upon any account; and the general tide of his prosperity did not cease to flow, except in the instance of the death of the younger of his two sons, which was in some degree compensated by the consular dignity of the elder. In his 75th year he was attacked with an incurable ulcer, and he is said to have put an end to his life, by abstaining from food.

The work of Silius, which has come down to the present time, is an epic poem on the second Punic war. In this he scarcely deviates from Livy, in the narration of transactions; but occasionally introduces a machinery, copied from Virgil, of whose style and manner he is an imitator. Pliny says, that "he writes with more diligence than genius." The best editions of this work are those of Drakenborch, 1717; and of Lefebvre de Villebrune, 4 vols. 12mo. 1782.

SILK, SERICUM, a very soft, fine, bright, delicate thread; the work of an insect, called *bombyx*, or the silk-worm.

The ancients were but little acquainted with the use and manufacture of silk; they took it for the work of a sort of spider, or beetle, who spun it out of its entrails, and wound it with its feet about the little branches of trees. This insect they called *ser*, from *Seres*, a people in Scythia, whom we now call the Chinese, who, as they thought, bred it; whence the silk itself they called *sericum*. But this *ser* of theirs has very little affinity with our silk-worm, *bombyx*: the former living five years; but the latter dying annually, enveloped in a yellowish bag or ball, which, wound out into little threads, makes what we call silk.

It was in the isle of Cos that the art of manufacturing it was first invented; and Pamphila, daughter of Platis, is honoured as the inventress. The discovery was not long unknown

unknown to the Romans. Silk was brought them from Serica, where the worm was a native. But so far were they from profiting by the discovery, that they could not be induced to believe so fine a thread should be the work of a worm; and thereupon formed a thousand chimerical conjectures of their own.

Silk was a very scarce commodity among them for many ages: it was even sold weight for weight with gold; inasmuch that Vopiscus tells us, the emperor Aurelian, who died A.D. 275, refused the empress, his wife, a suit of silk, which she solicited of him with much earnestness, merely on account of its dearness.

Others, however, with greater probability, assert that it was known at Rome so early as the reign of Tiberius, about A.D. 17.

Galen, who lived about the year of our Lord 173, speaks of the rarity of silk, being no where but at Rome, and only among the rich.

Heliogabalus, the emperor, who died A.D. 220, is said by some to be the first person who wore a holotricum, *i. e.* a garment of all silk.

The Greeks of Alexander the Great's army are said to have been the first who brought wrought silk from Persia into Greece, about 323 years before Christ; but the manufacture of it was confined to Berytus and Tyre, in Phœnicia, whence it was dispersed over the West.

At length, two monks, coming from the Indies to Constantinople, in 555, under the encouragement of the emperor Justinian, brought with them great quantities of silk-worms, with instructions for the hatching of their eggs, rearing and feeding the worms, and drawing out the silk, and spinning and working it. Upon this, manufactures were set up at Athens, Thebes, and Corinth. The Venetians, soon after this time, commencing a commerce with the Greek empire, supplied all the western parts of Europe with silks for many centuries; though sundry kinds of modern silk manufactures were unknown in those times, such as damasks, velvets, satins, &c.

About the year 1130, Roger II. king of Sicily, established a silk manufactory at Palermo, and another in Calabria; managed by workmen, who were a part of the plunder brought from Athens, Corinth, &c. of which that prince made a conquest in his expedition to the Holy Land. By degrees, Mezeray adds, the rest of Italy and Spain learned, from the Sicilians and Calabrians, the management of the silk-worms, and the working of silk; and at length the French got it by right of neighbourhood, a little before the reign of Francis I., and began to imitate them. Thuanus, indeed, in contradiction to most other writers, makes this manufacture of silk to be introduced into Sicily two hundred years later, by Robert the Wise, king of Sicily, and count of Provence.

It appears by 33 Hen. VI. cap. 5. that there was a company of silk-women in England so early as the year 1455; but these were probably employed in needle-works of silk and thread: and we find that various sorts of small haberdashery of silk were manufactured here in 1482; but Italy supplied England, and all other parts, with the broad manufacture, till the year 1489. In Spain, indeed, the culture and manufacture of silk seem to have been introduced in an early period by the Moors, particularly in Murcia, Cordova, and Granada. The silk manufactures of this last town were very flourishing, when it was taken by Ferdinand, &c. at the close of the fifteenth century.

In 1521, the French, being supplied with workmen from Milan, commenced a silk manufacture; but it was long after this time before they could obtain raw silk from the

worms; and even in the year 1547, silk was scarce and dear in France; and Henry II. is said to have been the first who wore a pair of silk knit stockings; though the first invention originally came from Spain, whence silk stockings were brought over to Henry VIII. and Edward VI. After the civil wars in France, the plantations of mulberry-trees were greatly encouraged by Henry IV. and his successors; and the produce of silk is at this day very considerable.

The great advantage which the new manufacture afforded, made our king James I. very earnest for its being introduced into England: accordingly it was recommended several times from the throne, and in the most earnest terms, particularly in the year 1608, to plant mulberry-trees, &c. for the propagation of silk-worms; but unhappily without effect; though from the various experiments we meet with in the Philosophical Transactions, and other places, it appears that the silk-worm thrives and works as well, in all respects, in England, as in any other part of Europe.

However, towards the latter end of this king's reign, *i. e.* about the year 1620, the broad silk manufacture was introduced into this country, and prosecuted with great vigour and advantage. In 1629, the silk manufacture was become so considerable in London, that the silk-throwsters of the city, and parts adjacent, were incorporated under the name of master, wardens, &c. of the silk-throwsters; and in 1661, this company of silk-throwsters employed above forty thousand persons. The revocation of the edict of Nantes, in 1685, contributed in a great degree to promote the silk manufacture in this kingdom; as did also the invention of the silk throwing machine at Derby, in 1719; for an account of which, see *SILK, Manufacture of*.

So high in reputation was the English silk manufacture, that even in Italy, as Keyser (Travels, vol. i. p. 289.) informs us, in 1730, the English silks bore a higher price than the Italian.

The silk-worm is an insect not more remarkable for the precious matter it furnishes for divers stuffs, than for the many forms it assumes, before and after its being enveloped in the rich cocoon or ball which it weaves for itself. From a small egg, about the size of a pin's head, which is its first state, it becomes a pretty big worm, or caterpillar, of a whitish colour, inclining to yellow. In this state it feeds on mulberry-leaves, till, being come to maturity, it winds itself up in a silken bag, or case, about the size and shape of a pigeon's egg; and becomes metamorphosed into an aurelia: in this state it remains without any signs of life, or motion; till at length it awakes to become a butterfly, after making itself a passage out of its silken sepulchre; and, at last, dying indeed, it prepares itself, by an egg which it casts, for a new life; which the warmth of the summer weather assists it in resuming.

As soon as the silk-worm, or caterpillar, is arrived at the size and strength necessary for beginning his cocoon, he makes his web; for it is thus they call that slight tissue, which is the beginning and ground of this admirable work. This is his first day's employment. On the second, he forms his folliculus, or ball, and covers himself almost over with silk. The third day, he is quite hid; and the following days he employs himself in thickening and strengthening his ball; always working from one single end, which he never breaks by his own fault; and which is so fine, and so long, that those who have examined it attentively, think they speak within compass, when they affirm that each ball contains silk enough to reach the length of six English miles.

In ten days' time, the ball is in its perfection; and it is now to be taken down from the branches of the mulberry-trees, where the worms have hung it. But this business

requires a great deal of attention; for there are some worms more lazy than others; and it is very dangerous waiting till they make themselves a passage, which usually happens about the fifteenth day.

The first, finest, and strongest balls are kept for the breed; the rest are carefully wound. If there be no more than can be well wound at once, they lay them for some time in an oven, moderately hot, or else expose them, for several days successively, to the greatest heats of the sun, in order to kill the insect; which, without this precaution, would not fail to open itself a way to go and use those new wings abroad, which it has acquired within. Ordinarily, they only wind the more perfect balls. Those that are double, or too weak, or too coarse, are laid aside; not as altogether useless, but that, being improper for winding, they are referred to be drawn out into skeins. The balls are of different colours; the most common are yellow, orange-colour, isabella, or flesh-colour. There are some also of a sea-green, others of a sulphur-colour, and others white; but there is no necessity for separating the colours and shades, to wind them apart, as all these colours are to be lost in the future scouring and preparing of the silk.

SILK, Manufacture of. In England, where silk is not produced in any quantities to be employed by the manufacturer, he must commence his operations upon the raw silk, with no other preparation than that of being wound off into skeins or hanks from the balls, or cocoons, which the silk-worms form.

In this state the silk is imported from those countries where it is produced, as Italy, Flanders, Spain, Portugal, Turkey, the East Indies, and China. A thread of this raw silk, drawn from the skein, is found to be composed of an assemblage of several of the fine fibres or threads produced by the worms; the fibres being united together by a natural gum, which is in the silk, and which is soluble in the hot water in which the cocoons are immersed when the silk is wound off.

To prepare this raw silk for use, it is wound from the skeins upon bobbins; the compound thread is then twisted, to unite the constituent fibres more firmly than they can be by the gum alone; and afterwards, being wound again upon fresh bobbins, two or three threads are twisted together to produce a stronger thread, fit for the weaver, who warps and finally weaves the silk into various articles of ornaments or utility, by processes very similar to the weaving of cotton or linen, but more delicately conducted.

In the countries where the silk is produced, the manufacture may be more properly said to commence with the operation of winding or reeling off the threads into skeins from the cocoons, or balls, in which the worms envelope themselves. These balls become an article of trade, as soon as the insect within them is killed by exposing them to heat, either of the sun, or in an oven, or by the steam of boiling water; and, in general, the breeders of silk-worms sell them, in this state, to persons who make a business of the operation of winding. In Piedmont, where capital silk is produced, it is conducted, as follows, by the aid of the silk reel represented in *Plate Silk Manufacture, fig. 1.*

The balls are thrown into hot water, contained in a copper basin or boiler, A, which is about eighteen inches in length and six deep, set in brick-work, so as to admit a small charcoal fire beneath it; or if a fire of wood is intended to be made, the fire-place must have a small flue or chimney of iron plate to carry off the smoke. At the side of the boiler is placed the reel, which is very simple. BB marks the wood-framing which sustains its parts: these are, the reel D,

upon which the silk is wound; the layer *a*, which directs the thread upon it; and the wheel-work *b c*, which gives motion to the layer. The reel, D, is nothing more than a wooden spindle, turned by a handle at the end; and within the frame, at each end, it has four arms mortised into it, to support the four battens or rails on which the silk is wound. The rails are parallel to the axis, and at such a distance, that they will form a proper-sized skein by the winding of the silk upon them, (it is usually a yard for each revolution.) One of each of the four arms is made to fold in the middle of its length with hinges, so as to cause the rail, which these two arms support, to fall in or approach the centre, and thus diminish the size of the reel, and admit the skeins of silk to be taken off at the end of the reel when the winding is finished.

Upon the end of the wooden spindle of the reel, and within the frame B, is a wheel of twenty-two teeth, to give motion to another wheel, *c*, which has about twice the number of teeth, and is fixed upon the end of an inclined axis, *c b*; this, at the opposite end, carries a wheel, *b*, of twenty-two teeth, which gives motion to an horizontal cog-wheel of thirty-five teeth. This wheel turns upon a pivot fixed in the frame, and has a pin fixed in it, at a distance from the centre, to form an excentric pin or crank, and give a backward and forward motion to the slight wooden rail or layer *a*, which guides the threads upon the reel: for this purpose, the threads are passed through wire-loops or eyes, *a*, fixed into the layer, and the end thereof opposite the wheel and crank, *b*, is supported in a mortise or opening made in the frame, B, so that the revolution of the crank will cause the layer to move, and carry the threads alternately towards the right or left. There is likewise an iron bar, *e*, fixed over the centre of the boiler at *e*, and pierced with two holes, through which the threads pass to guide them.

To describe the operation of reeling, it should be understood, that if the thread of each ball or cocoon was reeled separately, it would be totally unfit for the purposes of the manufacturer; in the reeling, therefore, the ends or threads of several cocoons are joined, and reeled together out of warm water, which softens their natural gum, and makes the fibres stick together, so as to form one strong smooth thread; and as often as the thread of any single cocoon breaks or comes to an end, its place is supplied by a new one, so that by continually keeping up the same number, the united thread may be wound to any length. The single threads of the newly added cocoons are not joined by any tie, but simply laid on the compound thread, to which they will adhere by their gum; and their ends are so fine, as not to occasion the least perceptible unevenness in the place on which they are laid.

The woman who conducts the reeling is seated before the basin A, and employs a boy or girl to turn the handle of the reel: a fire is lighted beneath the basin A; and when the water becomes nearly boiling hot, she throws into the basin two or three handfuls of cocoons, and leaves them some minutes, to soften that natural gum with which the silk is impregnated; then she stirs up or brushes the cocoons with a wisk of birch or of rice-straw, about six inches long, cut stumpy, like a worn-out broom; the loose threads of the cocoons stick to the wisk, and are drawn out: she then disengages these threads from the wisk, and by drawing the ends through her fingers, cleans them from that loose silk which always surrounds the cocoon, till they come off entirely clean: this operation is called *la battue*: and when the threads are quite clean, she passes four or more of them, if she intends to wind fine silk, through each of the holes in the thin

iron bar *e*, which is placed horizontally over the centre of the basin *A*; afterwards she twists the two compound threads (which consist of four cocoons each) twenty or twenty-five times round each other, that the four ends in each thread may the better join together by crossing each other, and that the thread of the silk may be round, which otherwise would be flat.

The threads, after passing through the holes in the iron bar *e*, and being twisted together, are passed through the eyes of the loops, *a*, of the layer, and thence being conducted to the reel, are made fast to one of its rails. The child who turns the reel, gives it the most rapid movement possible, and thus draws off the threads from the cocoons in the basin *A*. The slow traversing motion of the layer prevents the threads lying over each other upon the reel, until it has made so many revolutions in the air as to dry the gum of the silk so far, that the threads will not adhere together. After the reel is covered for about the breadth of three inches, by the gradual progression of the layer, it returns and directs a second course of threads over the first laid, and so on until the required length for the skeins is obtained. The machine winds two skeins at one time. As it is essential to the production of good silk, that the thread should have lost part of its heat and gummyness before it touches the bars of the reel, the Piedmontese are by law obliged to have a distance of thirty-eight French inches between the guides, *a*, and the centre of the reel; and the layer must also, under a penalty, be moved by cog-wheels instead of an endless cord, which is sometimes used in Italy, and which, if suffered to grow slack, will cause the layer to stop and not lay the threads distinctly, and that part of the skein will be glued together, whereas the cog-wheels cannot fail.

When the skeins are quite dry the reel is removed from the frame, and by the folding of two of its arms the skeins are taken off. A tie is made with some of the refuse silk on that part of each skein where it bore upon the bars of the reel, and another tie on the opposite part of the skein; after which it is doubled into a hank, and usually tied round near each extremity, when it is laid by for use or sale.

This operation appears very simple, but to produce a good thread requires much attention. The reeler must not wait until the thread of a cocoon is entirely exhausted before she joins on another, because the threads near the end have not above a quarter of their full thickness. The cocoons produce a very unequal length; some may be met with which yield 1200 ells, whilst others will scarcely afford 200 ells. In general, the production of a cocoon may be estimated from 500 to 600 ells in length. As often as the cocoons she winds are exhausted, or break, or only diminish, she joins fresh ones to keep up the requisite number, or the proportion; because, as the cocoons wind off, and the thread becomes finer, she must join two cocoons half wound to replace a new one. Thus she can wind three new ones and two half wound, and the silk will be equal to that produced from four to five cocoons. When she would join a fresh thread she must lay one end on her finger, throw it lightly on the other threads which are winding, and the gum will join it immediately, and it will continue to go up with the rest. She must not wind off her cocoons to the last, because when they are near at an end the hulk of the worm joins in with the other threads, and makes the silk foul and gouty. The silk may be wound of any size from one cocoon to 100, but it is difficult to wind more than thirty in a thread.

The nicety of the operation, and that part in which lies the greatest difficulty, is to wind an even thread, because as the cocoon winds off the end is finer, and other cocoons must be joined on to keep up the same size. This difficulty

of keeping the silk always even is so great, that (excepting a thread of two cocoons, which is called fuch) they do not lay a silk of three, four, or six cocoons; but a silk of three to four, four to five, or six to seven cocoons. In a coarser silk it cannot be calculated even so nearly as to four cocoons more or less; they say, for example, from 12 to 15, from 15 to 20, and so on.

During the operation of winding, the woman must always have a bowl of cold water by her, to dip her fingers in, and to sprinkle frequently upon the iron bar *e*, that the heat of the basin may not burn the threads, also to cool her fingers every time she dips them in the hot water, and to pour into the basin when necessary, that is, when the water begins to boil. The water must be just in a proper degree of heat; for when it is too hot, the thread is dead, and has no body; and when too cold, the ends which form the thread do not join well, and form a harsh silk. The heat of the water from which the cocoons are wound, causes that adhesion of the fibres which compose the silk: a thread can with difficulty be wound off when cold water is employed; but in this manner the adhesion is very slight, and the thread breaks with a slight force, or the least moisture will separate the fibres; but the silk wound from hot water cannot be separated except by hot water.

The old cocoons require the water to be very hot: if the threads break very frequently, it may be concluded that the water is too cold; or, on the other hand, if the silk comes off entangled, and in the state of wool, the water is too hot. When the first parcel of cocoons is finished, the basin, *A*, is cleaned, taking out all the striped worms, as well as the cocoons, on which there remains a little silk: these are thrown into a basket, into which the loose silk that comes off in making the battue is likewise put as waste silk, to be carded and spun into threads. The water in the basin must be changed four times a day for coarse silk, and twice only for good cocoons of fine silk: if the water is not changed, the silk will not be so bright and glossy, because the worms contained in the cocoons foul it very considerably. The reeler must endeavour to wind as much as possible with clear water, for if there are too many worms in it, the silk will be covered with a kind of dust, which afterwards attracts moths, which destroys the silk.

From the gummy or viscid material which silk gives out to water when the cocoons are infused in it, Chappe found that he was able to blow up the water into bubbles, or small balloons, far more permanent than those of soap and water, and offering all the colours of the rainbow. So close, indeed, is the texture of these silky bladders, that even the most subtle gas does not penetrate them. Chappe filled many of them, the diameter of each not exceeding three inches, with hydrogen gas, and found several of them continued in a state of suspension, in an apartment, for considerably more than twenty-four hours. It is not all silk, however, that is sufficiently glutinous for this purpose; that which is of a very deep yellow will not answer the same purpose. This silk, from its colour, is supposed to be produced by the worm in a peculiar disease, yet this is a state by no means uncommon.

All kind of silk which is simply drawn from the cocoons by the reeling, is called raw silk, but is denominated fine or coarse according to the number of fibres of which the thread is composed. In general, the raw silk requires dyeing; to prepare for which the thread is very slightly twisted, to render it strong, and more able to bear the action of the hot liquor, without separating the fibres or furring up. Silk-yarn, which is employed by the weavers for the woof or weft of the stuffs which they fabricate, is composed of

two or more threads of the raw silk, slightly twitted in a machine; and the thread employed by the stocking weaver is of the same quality, but composed of a greater number of threads, according to the thickness desired. Organzine silk is composed of two, three, or four threads of raw silk twitted, and so combined as to obtain the greatest strength: for this purpose, each thread of raw silk is twitted separately upon itself by a mill: the twist is given in a right-handed direction, and extremely tight. By a second operation of twitting, two of these threads are combined together, the twist being given in a contrary direction, and not above half as tight: this forms a thread similar to a rope. This description of silk, used for the warp of stuffs, is of the utmost importance to the manufacturer, for none of the principal articles can be fabricated without it. The Italians, from whom we formerly imported the silk in the state of organzine, for a long time kept the art of throwing it a profound secret. It was introduced into this country by the enterprise and skill of Messrs. Thomas and John Lombe, the latter having, at the risk of his life, and with wonderful ingenuity, taken a plan of one of these complicated machines in the king of Sardinia's dominions, from which, on his return, they established a similar set of mills in the town of Derby. (See DERBY.) In consideration of the great hazard and expence attending the undertaking, a patent was granted to Sir Thomas Lombe in 1718, for securing to him the privilege of working organzine for the term of fourteen years; but the construction of buildings and engines, and the instruction of the workmen, took up so much time, that the fourteen years were nearly expired before he could derive any advantage from it; in consequence of which, he petitioned parliament, in 1731, to grant him a further term: but parliament, considering it an object of national importance, granted him the sum of 14,000*l.* on condition that he should allow a perfect model of the machinery to be taken, and deposited in the Tower of London for public inspection. Similar mills were, in course of time, erected in different parts of the country; but owing to the difficulties that were experienced in procuring raw Italian silk of the proper size for organzine (the exportation of which was prohibited by the Italians), and to the mills having subsequently found employment for other purposes, the quantities worked into organzine, for many years, bore scarcely any proportion to the imports from Italy; it has however been since revived and improved, in consequence of which it is now carried on to a very considerable extent, as well in other parts of England as at Derby.

The process which the silk undergoes to bring it into this state, consists of six different operations. 1. The silk is wound from the skein upon bobbins in the winding machines. 2. It is then sorted into different qualities. 3. It is spun or twitted on a mill in the single thread, the twist being in the direction of from right to left, and very tight. 4. Two or more threads thus spun are doubled or drawn together through the fingers of a woman, who at the same time cleans them, by taking out the slubs which may have been left in the silk by the negligence of the foreign reeler. 5. It is then thrown by a mill, that is, the two threads are twitted together, either slack or hard, as the manufacture may require; but the twist is in an opposite direction to the first twist, and it is wound at the same time in skeins upon a reel. 6. The skeins are sorted according to their different degrees of fineness, and then the process is complete.

The first operation which the raw silk undergoes is winding, that is, drawing it off from the skeins in which it is imported, and winding it upon wooden bobbins, in which

state it can go to the other machines. The winding-frame is shewn at *fig. 2.* of the plate, or rather a part of it, which will wind six threads at once, and by increasing the length it may be made to receive any number. Each of the skeins is extended upon a slight reel AA, called a swift; it is composed of four small rods, fixed into an axis, and small bands of string are stretched between the arms to receive the skein, but at the same time the bands admit of sliding to a greater or less distance from the centre, so as to increase the effective diameter of the reel, according to the size of the skein, because the skeins, which come from different countries, vary in size, being generally an exact yard, or other similar measure, of the country where the silks are produced. The swifts are supported upon wire pivots, upon which they turn freely when the silk is drawn off from them; but in order to cause the thread to draw with a gentle force, a looped piece of string, or wire, is hung upon the axis within the reel, and a small leaden weight, *c*, being attached to it, will cause a sufficient friction. B, B, are the bobbins which draw off the threads; they are received in the frame, and are turned by means of a wheel beneath each, the bobbin having a small roller upon the end of it, which bears by its weight upon the circumference of the wheel, and the bobbin is thereby put in motion to draw off the silk from the swift. D is the layer, a small light rod of wood, which has a wire-eye fixed into it, opposite to each bobbin, so as to conduct the thread thereupon; and as the layer moves constantly backwards and forwards, the thread is regularly spread upon the length of the bobbin. The motion of the layer is produced by a crank fixed upon the end of a cross-spindle, E, which is turned by means of a pair of bevelled wheels from the end of the horizontal axle, upon which the wheels for turning all the bobbins are fixed.

These winding-machines are usually situated in the top building of the mill, the frames being made of great length, and also double, to contain a row of bobbins and swifts at the back as well as in front. Two of these double frames are put in motion by cog-wheels from the vertical shaft, F, which ascends from the lower apartments of the mill, where the twisting-machines are placed. The winding-machines require a constant attendance of children to mend the ends or threads which are broken; or when they are exhausted, they replace them by putting new skeins upon the swifts. When the bobbins are filled they are taken away, by only lifting them up out of their frame, and fresh ones are put in their places.

A patent has been lately taken out by Messrs. Gent and Clarke, for a new construction of the swifts for winding-machines: they are made with six single arms instead of four double ones; and the arms are small flat tubes, made to contain the stems of wire forks, which receive the skein instead of the bands of string in the common swifts. These forks admit of drawing out from the tubes until the swift is sufficiently enlarged to extend it; but as they extend the skein at six points instead of four, as in the common one, the motion is more regular. Instead of the weight which causes the friction, a spring is used to press upon the end pivot of the axis, and make the requisite resistance.

The twitting of the silk is always performed by a spindle and bobbin, with a flyer, but the construction of the machine which puts the spindle in motion is frequently varied. The limits of our plate do not admit a representation of the great machines, or throwing-mills, such as are used at Derby, and at almost all the other great silk-mills in England. In *fig. 3.* we have given a drawing of a small machine, which is similar in the parts which act upon the silk; and indeed many mills employ such machines constructed on a large scale.

The

SILK.

The one in our plate contains only thirteen spindles, and is intended to be turned by hand, a method which is too expensive for this country, but is common in the south of France, where many artificers purchase their silk in the raw state, and employ their wives or children to prepare it by these machines, which they call ovals, because the spindles *b, b*, are arranged in an oval frame, *G H*. *B* is the handle by which the motion is given; it is fixed on the end of a spindle, *R*, which carries a wheel, *D*, to give motion to a pinion upon the upper end of a vertical axle, *E*: this, at the lower end, has a drum or wheel *F*, to receive an endless strap or band, *a a*, which encompasses the oval frame *G*, and gives motion to all the spindles at once. The spindles *b, b*, are placed perpendicularly in the frame *G H*, their points resting in small holes in pieces of glass, which are let into the oval plank *G*; and the spindles are also received in collars affixed to an oval frame *H*, which is supported from the plank, *G*, by blocks of wood; *d* and *a* are small rollers, supported in the frame *G H*, in a similar manner to the spindles: their use is to confine the strap, *a*, to press against the rollers of the spindles with sufficient force to keep them all in motion.

The thread is taken up as fast as it is twisted by a reel, *K*, which is turned by a wheel, *b*, and a pinion, *i*, upon the end of the principal spindle, *R*. The threads are guided by passing through wire-eyes, fixed in an oval frame, *L*, which is supported in the frame of the machine by a single bar or rail, *l l*, and this has a regular traversing motion backwards and forwards, by means of a crank, or excentric pin, *k*, fixed in a small cog-wheel, which is turned by a pinion upon the vertical axis *E*; the opposite end of the rail, *l*, is supported upon a roller, to make it move easily. By this means the guides are in constant motion, and lay the threads regularly upon the reel *K*, when it turns round, and gathers up the silk upon it, as shewn in the figure.

One of the spindles is shewn at *r* without a bobbin, but all the others are represented as being mounted and in action. A bobbin, *e*, is fitted upon each spindle, by the hole through it being adapted to the conical form of the spindle, but in such manner, that the bobbin is at liberty to turn freely round upon the spindle: a piece of hard wood is stuck fast upon each spindle, just above the bobbin, and has a small pin entering into a hole in the top of the spindle, so as to oblige it to revolve with the spindle; this piece of wood has the wire-flyer, *b*, fixed to it: the flyer is formed into eyes at the two extremities; one is turned down, so as to stand opposite the middle of the bobbin *e*; and the other arm, *b*, is bent upwards, so that the eye is exactly over the centre of the spindle, and at a height of some inches above the top of the spindle. The thread from the bobbin, *e*, is passed through both the eyes of this wire, and must evidently receive a twist when the spindle is turned; and at the same time, by drawing up the thread through the upper eye, *b*, of the flyer, it will turn the bobbin round and unwind therefrom. The rate at which the thread is drawn off from the bobbin, compared with the number of revolutions which the flyers make in the same time, determines the twist to be hard or soft; and this circumstance is regulated by the proportion of the wheel, *b*, to the pinion *i*, from which it receives motion; and these can be changed when it is required to spin different kinds of silk. The operation of the machine is very simple; the bobbins filled with silk in the winding-machine, *fig. 1*, are put loose upon the spindles at *e*, and the flyers are stuck fast upon the top of the spindles: the threads are conducted through the eyes of the flyers *b*, and of the layers *L*, and are then made fast to the reel *K*, upon which it will be seen that there are double the number of skeins to that of the spindles represented, because

one half of the number of the spindles is on the opposite side of the oval frame, so that they are hidden. With this preparation the machine is put in motion, and continues to spin the threads by the motion of the flyers, and to draw them off gradually from the bobbins, until the skeins upon the reel are made up to the requisite lengths. This is known by a train of wheel-work at *n o p*, consisting of a pinion, *n*, fixed upon the principal spindle *R*, turning a wheel *o*, which has a pinion fixed to it, and turning a larger wheel *p*; this has another wheel upon its spindle, with a pin fixed in it, which at every revolution raises a hammer, and strikes upon a bell, *s*, to inform the attendant that the skeins are made up to a proper length. When this machine is employed for the first operation of twisting the organzine, the wheel, *b*, must be larger, and the pinion, *i*, smaller than represented, in order that the reel, *K*, may be turned slowly, and the threads will therefore receive a stronger and closer twist. Also, the handle *B* is turned in an opposite direction to that in which it must move for the final throwing off the two or three twisted threads together; and as it must also move for twisting the raw threads together for the warp of silk-stuffs, and for weaving stockings, this reverse movement makes no alteration in the machine, except that it will give twist in a contrary direction; for it is always necessary, when two or more twisted threads are combined by twisting, that the twist of the original threads shall be in the opposite direction to that twist which unites them into one thread, in the same manner as for making ropes, organzine silk being in fact small rope, and stocking-silk or warp being only yarn. The silk which is intended to be dyed, is previously twisted very slightly in this machine, and of course in that direction which will suit the purpose for which it is ultimately intended; *viz.* whether for yarn or organzine.

The great mills for twisting silk, originally introduced by Messrs. Lombe, though very complicated, are simple in their operation, because the complexity arises from the great number of spindles which are actuated by the same movement, every one of which produces its effect independent of the others, and in the same manner as the oval which we have described. A machine is contained in a circular frame, of which the diameter varies from 11 to 13, 15, and even 17 feet; but 15 feet is the general size of the original Piedmontese machines. In the centre of the frame is a perpendicular axis or spindle, coming up through the floor of the chamber, and rising to the ceiling; it is put in motion by a communication of wheel-work from a water-wheel, or otherwise from a horse-wheel. The axis has upon it two, three, or four horizontal wheels, according to the height of the machine, which revolve with it, and are of a sufficient size to fill nearly all the interior of the circular frame, and act upon the pulleys or rollers of the spindles, which are supported vertically in the frame, and arranged round the machine, at equal distances, in a circle, the number being proportioned to the dimensions of the machine. The spindles are also arranged in as many different stages of height as there are wheels upon the vertical spindle; for the circumference of each wheel presses against the rollers of the spindles which are arranged round it; and thus, when the wheel revolves, it gives a very rapid motion to all the spindles at once, by the contact of the edge of the wheel, but without any strap, as in the oval. Each spindle has a bobbin, filled with silk, fitted upon the top of it, and from this the silk is carried up to a horizontal reel, which is turned round slowly by the machine, and draws off the thread gradually from the bobbin: the flyer, being all the while in rapid motion, twists the thread upon itself, or, if two or three threads are previously wound together upon the bobbin, they will be twisted

twisted round each other. Each reel serves to take up the thread from several spindles which are situated beneath it: thus, in a mill of fifteen feet diameter, there will be six spindles beneath each reel.

To explain this machine more clearly, we will give a description of one of thirteen feet diameter, which has four large wheels and stages of spindles, two of which are for giving the first preparation to the organzine: the spindles revolve in a direction from right to left. The spindles of the other two stages are for the finishing the twist, and also for twisting the single threads which are to be used for warp or for stocking-weaving: they revolve in a contrary direction to the former. The frame of the machine consists of two wooden circles of thirteen feet diameter, one placed upon the floor of the mill, and the other at a height of fifteen feet above, the two being united by fourteen upright pillars of wood, which altogether compose a large cylindrical frame or lantern. Each stage contains eighty-four iron spindles, placed vertically, and supported in the stage, which is formed of two wooden circles, extended round between the fourteen uprights of the lantern, and fixed one above the other, at about a distance of four inches asunder, so as to support the spindles between them, in the same manner as the pieces, G, H, of the oval last described.

The circles of the stage are of a rather less diameter than the two circles which compose the top and bottom of the lantern; so that the spindles will be rather within the circle of the frame of the lantern, and admit the wheels of the central axis to act upon them. For this purpose, each of the circles of the stage is made up by fourteen segments fixed between the uprights, and each segment supports six spindles, making up the number of eighty-four in the whole circle. The spindles, like those of the oval, are sharp-pointed at the lower end, and the points rest in small holes made in pieces of glass, which are let into the lower circle of the stage, whilst the upper circle sustains the spindle at a height of four or five inches above the point, leaving full one-third of the length of the spindle projecting above, for the purpose of fitting the bobbin upon it. The upper circle of the stage is rather smaller than the lower, because the spindles do not pass through it, but through holes in small pieces of hard wood, which project from it, so as to be exactly above the pieces of glass which sustain the points of the spindles. Each spindle has a small roller fixed upon it in the space between the two circles of the stage, and it is the contact of the rim of the great wheel upon these that causes the revolution of the spindles when the wheel revolves. In order to make the contact certain, the exterior rim of the great central wheel is made in several segments, and each segment has a constant tendency to recede from the central axis by the action of a weight, and thus presses against the rollers of the spindles. In order to give the reverse movement of the spindles, which we have before spoken of in the description of the oval, the great wheels for two of the stages are made differently from those which we have just described, so that the segments of the rim will act upon the outsides of the rollers of the spindles, instead of the insides: for this purpose the wheels are made larger than the stages in which the spindles are placed, and from the rim of the wheel small pillars rise up to support the segments, which act upon the rollers of the spindles in front or withoutside of the circles, instead of the inside, as is the case with the other stages, in consequence of which the spindles of these stages turn in opposite directions. The reels are placed over the bobbins, to take up the threads when twisted; and the rollers of the different spindles are made smaller or larger, as is required, to give more or less twist to the silk

operated upon by them; for the velocity with which the spindles revolve, compared with the rate at which the reels take up the thread, determines the degree of twist which the thread will have; and to render this equable, the reels which draw off the silk from the bobbins of the spindles are turned regularly with the motion of the machine by means of wheel-work, which is more easily conceived than described: it is sufficient to state that it receives its motion from the central vertical axis. There is also a layer adapted to each reel, with a wire-eye to receive each thread; and the layers having a slowly reciprocating motion, distribute the threads regularly upon the reels, in a similar manner to that first described for the oval. One of these reels is placed between each of the uprights of the machine, so as to make fourteen reels in the whole circle of each stage, and every reel serves to take the silk from the bobbins of six spindles. The whole machine in the four stages contains 336 spindles.

A machine of four stages is so high, as to reach through two floors of the mill, and for this purpose the upper floor is made with a large round opening, to admit the machine: this floor serves the people who attend the machine, and change the bobbins when exhausted, and also remove the finished silk from the reels.

The spindles in the upper stages are usually devoted to the first twisting of the single threads for the organzine, and therefore turn the reverse way, as before mentioned; and as the silk is afterwards to be thrown, or re-twisted, they are drawn off from the bobbins by large bobbins of three inches diameter, and four inches long, instead of the reels. These bobbins are stuck six together upon a long spindle, situated horizontally, and turned by similar wheel-work to that which actuated the reels; they have similar layers to conduct the silk regularly upon the bobbins from one end to the other, so that the operation is not at all different.

In many of the best silk-mills, they have abandoned the original method of turning the spindles, for the preparation of organzine, the reverse way, by making the action of the wheels upon the outside, instead of the inside, of the circle of spindles. Instead of them they employ two different machines, one for the first operation on organzine, and the other for the second operation, both of them constructed with the wheels withinside: but the motion of the two machines is reversed to each other.

Fig. 5. represents a single spindle of a throwing machine, which, though the same in its action as the great mill, is different in its construction. G and H represent portions of the rails or circles of the stage which support the spindle, and *aa* is a part of the rim of the great wheel of the central axle. This wheel is not made in segments, as before described, but is made very truly circular, and covered with leather on the edge, that it may act with more force to turn the roller, *t*, of the spindle. The point of the spindle rests in a glass cap, supported by the rail G, and the roller, *t*, is always made to press against the rim of the great wheel, *aa*, by a small lever, *d*, and a spring, which, after turning over a pulley, has the weight, *c*, made fast to it, to press the spindle always towards the wheel. In this machine, instead of the reel, the thread is taken up by a bobbin, K, is put into a frame, *m*, which moves on pivots, and by a weight, *n*, is pressed down so as to make the bobbin bear upon the edge of a wheel, *b*, which is kept in constant and regular motion, by the same kind of movement which turns the reels of the great machine. The intention of this is, that the action of the wheel, *b*, to turn the bobbin, being communicated by pressure against the part upon which the silk is to wind, will be constant,

stant, and will not draw more when the bobbin is large and full, or less when it is empty, as must be the case when the motion is given to the axis of the bobbin.

After the silk is twisted in a right-hand direction, if it is intended for yarn, or for dyeing; or in a left-hand direction, if it is prepared for organzine; it must be wound on fresh bobbins, with two or three threads together, preparatory to twisting them into one thread. In the original machines at Derby this was done by women, who, with hand-wheels, wound the threads from two or three of the large bobbins, upon which the silk is gathered instead of the reels, and assembled them two or three together upon another bobbin, of a proper size to be returned to the twisting mill. We have seen an attempt for a machine to perform the doubling, which is slightly represented in *fig. 4*. The whole machine itself is very similar to the winding-machine, *fig. 2*, but instead of the swift, the bobbins from the throwing-mill are placed in front at *A*, *fig. 4*, two or three in a row. The threads from these are passed over the rail *m*, and beneath a piece of wood, *n*, both which, being covered with cloth, have the same effect to clean the silk by drawing through them, as the fingers of the winder. *B* is the bobbin upon which the two or three threads are to be wound together; it is turned by a wheel, *F*, upon which it rests, the same as the bobbins of the winding-machine; and *D* is the laver, which, for convenience, is in this case placed behind the bobbin, *B*; and the wire-eye, *d*, which receives the three threads, is made to reach over to the front. The additional apparatus consists of a small piece of wood, *e*, which slides freely up and down, in a hole, through a fixed board, *f*. On the top of the slider, *e*, is an eye of wire, through which one of the single threads of silk passes in its passage from between the pieces *m*, *n*, to the bobbin *B*: there is one of these sliders, *e*, to each of the three threads; *t v* is a lever moving on the centre *w*; the end *t* is immediately beneath the small sliders *e*, and the end *v* is formed to a hook, to catch into the notches which are made in the end of the bobbin *B*. A small counter weight, *x*, always causes the hook, *v*, of this lever to recede from the bobbin; but if any one of the three threads break, it suffers the slider *e*, which belongs to it, to descend upon the end, *t*, of the lever, and depresses the end of the lever, so as to bring the hook, *v*, in a situation to catch a tooth of the bobbin *B*, and stop its motion. By this means the winding of three threads together is rendered equally certain with the winding of one; for when any one breaks, the operation of winding on that bobbin stops, until the attendant repairs the broken thread, and puts the machine again in motion. We have lately been informed, that a machine for winding two and three threads together is becoming common in the silk-mills, but we do not know if it is the same with this one, which however is not evidently impracticable.

The bobbins, being thus filled with double or triple threads, are carried back to the throwing machine, and are there spun or twisted together, the manner of doing which does not differ from the operation which we have before described. In this second operation the silk is taken up by reels instead of bobbins, and is thus made up into skeins. The degree of twist varies with the purpose for which the silk is intended; and the wheels which give motion to the reels are for this purpose adapted to the degree of twist which the silk is desired to have. The silk, being now spun, requires only the preparation of boiling to discharge the gum, and render the silk fit to receive the dye, and also to render it soft and glossy. The silk is boiled for about four hours, in a boiler filled with water, into which a small quantity of soap is put; this opera-

tion dissolves the gum, which before could be felt upon the silk, and rendered it harsh. After the boiling, it is well washed in a current of clear water, and when dried, will be found to have lost about one-fourth of its weight: at the same time the volume of the silk is sensibly increased, and it has acquired that soft texture and glossiness, which are the principal beauties of silk. This change is produced by the dissolution of the gum, which, in the first instance, was the only adherence of the fibre to form a thread, but by the operation of the twisting the fibres are firmly united, and no longer require the gum. It is also necessary, in order to give a fine dye to the silk, that the gum should be removed, because it would prevent the entrance of the dyeing matter to the centre of the thread, and thus impair the beauty of the colour. If the silk was thus boiled before the twisting, nothing but a fine entangled down or wool would be obtained, and it would require spinning, by a similar process to that of cotton, before a thread could be obtained. This, indeed, is necessary for that portion of waste silk which is drawn from the cocoons in the first operation of reeling; also for those cocoons which are reserved for breeding, and from which the moths eat their way out by holes, which render it impracticable to wind off the silk. This waste silk, when carefully spun by a spinning-wheel, is called spun silk, and the thread is not inferior to the regular silk which is wound off: indeed, the winding off the silk into a thread united by its gum, is of no advantage farther than as a preparation for spinning, from which process the thread obtains its strength.

The silk is now in a state for use: if it is for stocking-weaving, or sewing, or if intended for weaving into stuff, it only requires warping to be put into the loom. The operation of warping is to put together all the threads which are to compose the warp of the intended piece of stuff, and lay them parallel, so that the warp, being put into the loom, will have no slack threads, nor any which are strained too tight. Formerly, this operation was performed by stretching the threads out at length in a field, or by extending them in a frame, and winding them backwards and forwards over pegs. The warping machine now universally employed is shewn in *fig. 6*, where *AA* is a tressel or stool, which supports the small bobbins *b, b*, upon which the silk is wound. The number of these is equal to the number of threads which the warp of the intended piece of stuff is to have in its breadth. The threads from all these bobbins are drawn over wires *d, d*, which are in front of the bobbins, and are then all brought together, and passed through an opening in a piece of wood *D*; this conducts the threads all together upon a large reel *E E*, which is supported in a frame *F F F*, and turned round by means of a pulley at the lower end of its axle, from which an endless band is continued to a second wheel *G*, mounted on a spindle, and turned by a handle. This latter spindle is supported in a sort of stool *H*, upon which a child sits down, and at the same time turns the handle and puts the reel in motion, so as to draw the warp or assemblage of threads off from the several bobbins, and lay it upon the reel *E*. The piece of wood *D* is fitted upon one of the upright pieces, *F*, of the frame, to slide freely up and down upon it, and is suspended by a cord, which, after passing over a pulley *f*, is wrapped round the spindle of the machine at *c*: by this means, the motion of the reel, *E*, draws the cord, and raises up the piece *D*, so as to lay the warp upon the circumference of the reel, in a regular spiral, from one end to the other, and prevent the coils lapping one upon another. When the required length of warp is wound upon the reel, the ends of all the threads are cut off, tied together, and thus drawn off from the reel and rolled up into a large ball,

SILK.

in which state the weaver takes it, and mounts it in his loom.

For the subsequent operations of weaving we shall refer to the article **WEAVING**, because the weaving of silk goods is the same as for any other, except that finer and more beautiful articles are produced in this substance than in any other. Some information on the details of weaving mechanism will be found under our articles **DRAUGHT of Looms**, **DRAW-LOOM**, **DIAPER**, **DIMITY**, and **DORNOCK**; and though these are rather the weaving of linen and cotton than silk, the same principles apply to silk, as will be more fully explained under **WEAVING**; where a description of weaving ribbands and figured silks will be given.

Silk is distinguished by different names according to its different states. Thus,

SILK, Spun, is that taken from the ball, without fire, and spun into thread without any coction: such as is most, if not all, that is brought into England from the Levant; *i. e.* from Persia by the way of Turkey, from Bengal in India, and from China. The raw spun silk is commonly worked up into two sorts, called *organize* and *tram*: the former is made by giving a throw or twist to each thread of raw spun silk singly, and then doubling two of these twisted threads together, and twisting them smartly together; this forms the warp or length of a piece when manufactured. The tram, or shoot, which makes the breadth of the piece, is formed by twisting two or more threads of raw silk slack. The waste raw silk, or refuse in reeling, &c. is collected, carded, and spun, and called *hops* silk; this is doubled and thrown, and often made into a cheap sort of silk-stockings, which are very strong and durable.

In the French silk-works, the greatest part of this raw silk passes for little better than a kind of fine floretta; yet, when spun, it makes a bright thread, and serves for the manufacture of stuffs of moderate value and lustre. But the spun silks of the Levant, whence most of our's come, are exceedingly fine and beautiful. The difference arises hence, that in France, the best balls are reeled off in boiling water, and only the refuse made into spun silk; whereas, in the Levant, there is no such thing as reeling or winding on the fire, but the silks are all sent in bales, or packs, as they are drawn from off the balls; so that they are only distinguished by their quality of fine, middling, and coarse.

SILK, Boiled, is that which has been boiled in water, to facilitate the spinning and winding. This is the finest of all the sorts of silk manufactured in France, and is seldom used but in the richest stuffs; as velvets, taffeties, damasks, brocades, &c.

There is also another kind of boiled silk, which is prepared by boiling, to be milled; and which cannot receive that preparation, without being first passed through hot water. By the laws of France, it has been prohibited to mix raw with boiled silk; both as such a practice spoils the dyeing, and as the raw silk corrupts and cuts the boiled.

SILKS, thrown or twisted, are such as, besides their spinning and winding, have received their milling or throwing.

This they receive in a different degree, as they are passed oftener or seldom over the mill; properly, however, thrown silks are those in which the threads are pretty thick-thrown, and twisted several times.

The thrown silk comes to us chiefly from Leghorn, Genoa, Naples, and Messina.

SILKS, Slack, are such as are not twisted, but are prepared, and dyed for tapestry, and other works with the needle.

SILK, Eastern or East Indian. That popularly thus called is not the work of the silk-worm, but comes from a plant that produces it, in pods, much like those of the cotton-

tree. The matter this pod contains is extremely white, fine, and moderately glossy; it spins easily, and is made into a kind of silk, that enters the manufacture of several Indian and Chinese stuffs.

SILKS, French. It is only in the most southern provinces of France that silk is cultivated, mulberry-trees planted, and worms bred. The principal places are Languedoc, Dauphiné, Provence, Avignon, Savoy, and Lyons. This last place, indeed, furnishes very few silks of its own growth; but it is the great staple whence the merchants of Paris, and the other cities, are to fetch them. At least, they are obliged to have them pass through Lyons, if they bring them from other places, either by land or sea. There have been computed to enter Lyons, *communibus annis*, six thousand bales; the bale valued at one hundred and sixty pounds weight; of which six thousand bales, there are one thousand four hundred from the Levant, one thousand six hundred from Sicily, one thousand five hundred from Italy, three hundred from Spain, and one thousand two hundred from Languedoc, Provence, and Dauphiné.

At the time when the manufactures of Lyons were in their prosperity, there were reckoned to be eighteen thousand looms employed in the silk manufacture; but in 1698, there were not reckoned four thousand. However, this manufacture afterwards revived, and a great part of Europe has been supplied from hence with brocade and rich silks. The decay has not been less notable at Tours; they had formerly there eight hundred mills for winding and preparing the silks; eight thousand looms to weave them; and forty thousand persons employed in the preparation and manufacturing of them; but these have been reduced to seventy mills, twelve hundred looms, and about four thousand persons. The revolution has, however, made such an alteration in the manufactures and trade of France, and they are still (1816) in so unsettled a state, that no correct estimate of them can be obtained.

SILKS, Sicilian. The commerce of the silks of Sicily has been very considerable; and the Florentines, Genoese, and Lucese, are the people who have chiefly availed themselves of it. Great quantities were yearly brought thence, especially from Messina; part of which they used in their own manufactures, and sold the rest to their neighbours the French, &c. with profit. The Italians had this advantage, especially the Genoese, over other people, that, having large establishments in the island, they were reputed as natives, and paid no duty for the export.

Part of the Sicilian silks is raw, the rest are spun and milled; of which last kind, those of St. Lucia and Messina are the most valued. The raw unwrought silks were always sold for ready money; the others, sometimes, in exchange for other goods. See **SICILY**.

SILKS, Italian. The silks brought from Italy are partly wrought, and partly raw and unwrought. Milan, Parma, Lucca, and Modena, furnish none but the latter kind; Genoa most of the former; Bologna affords both kinds. The finest Italian wrought silk comes from Piedmont, Novi, Bergamo, and Bologna; and is imported into England from the ports of Nice, Genoa, and Leghorn.

The silk we have from Italy is generally thrown, and serves for warp for our manufactures.

SILKS, Spanish, are all raw; and are spun, milled, &c. in England, according to the several works in which they are to be used.

SILKS, Turkey, are all raw. One advantage we have in the commerce of the Levant, in silks, wanting in those of Sicily, is, that the latter are confined to a particular season of the year; whereas the former are bought at all times.

They

They are brought from Aleppo, Tripoli, Sayda, and from the isle of Cyprus, Candia, &c. But the principal place of commerce, especially for the silks of Persia, is Smyrna. The silks are brought hither in caravans, from the month of January to September. The caravans in January are laden with the finest silks; those of February and March being indifferent ones; the rest, the coarsest. They all come from the several provinces of Persia, chiefly those of Ghilan and Shirvan, and the city of Schamachia, situate near the edge of the Caspian sea; from which three places, a Dutch author assures us, there have not come less than thirty thousand bales of silk in a year. Ghilan produces the best and greatest quantities of silk; next to this are Shirvan and Erivan, then Mazanderan, and lastly Astrabad; but the latter is much inferior, serving only for a manufacture mixed with cotton; that of Mazanderan and Astrabad is seldom or ever exported.

Ardeuil, or Ardebil, another city of Persia, not far distant from these silk countries, is the place where silks are laid up, and whence the caravans set out for Smyrna, Aleppo, Scanderoon, and Constantinople; and it is this city, with Schamachia, that have always been esteemed the centre of the silk trade; which has been several times attempted to be removed from Smyrna, and the Mediterranean, in favour of Archangel, and the White sea, by carrying them across Muscovy, by the Volga and Dwina, two rivers that traverse the principal provinces of that vast empire.

This new course of the Persian silks into Europe was first proposed by Paolo Centurio, a Genoese, to the czar Basil, under the pontificate of Leo X. The French had the same design in 1628. The duke of Holstein, in 1633, sent ambassadors to the court of Persia, purely with the same view. And in 1668, the czar Alexis Michael attempted the thing himself; but he was disappointed by the rebellion of the Cossacks, and the surprise of Astrakhan.

In 1688, the commerce of Persian silks had nearly been removed from Smyrna by an earthquake, which almost overturned the whole city; and, doubtless, the removal had been effected, but for the vigorous means used by the Turks to prevent it. Smyrna, however, still remains in her ancient possession; and the several nations of Europe continue every year to send their fleets, to fetch away the silks.

SILKS, China, Japan, and Indian. Several provinces of China are so fertile in mulberry-trees, and their climate is so agreeable to the nature of silk-worms, that the quantity of silks there produced is incredible; the single province of Tchehiang might supply all China, and even a great part of Europe, with this commodity. The silks of this province are the most esteemed, though those of Nankin and China be excellent.

The silk-trade is the principal in China, and that which employs the most hands; but the European merchants who deal in it, especially in wrought silks, are to be careful of the spinning, &c. the waste being usually very great, as the French East India company have found to their cost.

Japan would not afford fewer silks than China; but that the Japanese, a barbarous and distrustful people, have interdicted all commerce with strangers, especially with Europeans, excepting with the Dutch; who are said to be admitted on certain impious terms, related by Tavernier, but which, we must own, we cannot credit. The Dutch have endeavoured to vindicate themselves from these by the pens of several famous writers.

Great quantities of both raw and wrought silk are furnished by other parts of Bengal, and by several provinces of

Hindoostan, which partly supply the natives, and afford a very considerable exportation to Europe. Several thousand bales of raw silk are annually imported from Bengal and China; some of which is, in this state, used for making princes' stuffs, but the greater part is prepared for the manufacturers by the silk-throwsters.

SILK, Laws relating to. The duties on silks and calicoes being under the same regulations with those on printed linens, the law respecting them is inserted under the article **LINEN**. By the 13 & 14 Car. II. c. 15. s. 2. no person shall exercise the trade of a silk-throwster, unless he hath served seven years' apprenticeship, on pain of 40s. a month, half to the king, and half to him that shall sue in any court of record, or at the assizes, or quarter-sessions of the peace. By 9 & 10 W. c. 43. no foreign silks, called alamodes or lutestrings, shall be imported but in the port of London, on notice first given to the commissioners of the customs, and licence had from them, on pain of forfeiture, or the value; and they shall be sold, and exported again; and the offender so importing, and also the receiver and person offering to sell the same, shall forfeit 500*l*. Being marked and sealed by order of the commissioners, any person who shall counterfeit the custom-house seal, or that of the lutestring company, shall forfeit 500*l*., and be set in the pillory for two hours. And any person who shall buy and sell, and have in his custody, any alamodes or lutestrings, sealed or marked with a counterfeit seal or mark, shall forfeit the same and 100*l*.

However, none but custom-house officers, or persons deputed by the lutestring company, and having writs of assistance under the seal of the exchequer, shall seize lutestrings or alamodes within the bills of mortality. (5 Ann. c. 20.) The penalties shall be two-thirds to the king, and one-third to him that shall seize or sue in any court of record.

By 3 Geo. III. c. 21. and 5 Geo. III. c. 48. if any person shall import any ribbands, laces, or girdles, not made in Great Britain, whether the same shall be wrought of silk alone, or mixed with other materials, the same shall be forfeited, and may be seized by any officer of the customs, in whatever importers', venders', or retailers' hands they may be found; and the importer, and every person assisting therein, and the venders and retailers in whose custody they shall be found, or who shall sell or expose the same to sale, or conceal with intent to prevent the forfeiture, shall forfeit respectively 200*l*., with costs. Half the said penalties to be to the king, and half to the officer who shall inform and prosecute.

But if any officer of the customs shall neglect or refuse, for one month after condemnation, to prosecute to effect any person for any of the said pecuniary forfeitures, any other person may sue for and recover the same; half thereof to go to the king in like manner, and half to him who shall sue.

And when the goods seized (being out of the limits of the bills of mortality) shall not exceed the value of 20*l*., two justices, on information before them that such goods were seized, as unduly imported, may hear and determine the same, and proceed to condemnation or discharge.

After seizure, until condemnation or discharge, the said goods shall be deposited in one of the king's warehouses, if the seizure be within the bills of mortality; elsewhere, in the hands of the chief magistrate or constable; and the same shall be free to inspection, with leave of the court, judge, or justices, before whom the prosecution shall be.

And after condemnation, the said goods shall be publicly sold by the candle for exportation; half of the produce by

such sale to be to the king, and half to the officer who shall seize and secure the same; and the same goods shall not be delivered out of the warehouse, till security shall be given for exportation, and that the same shall not be landed again in any part of his majesty's dominions.

By 5 Geo. III. c. 48, if any foreign manufactured silk-stockings, silk-mitts, or silk-gloves, shall be imported into this kingdom, or any part of the British dominions, the same shall be forfeited, and liable to be searched for and seized as other uncustomed goods; and every person who shall import the same, or be assisting therein, and the vendors and retailers in whose custody they shall be found, or who shall sell or expose the same to sale, or conceal with intent to prevent the forfeiture, shall, over and above the forfeiture of the goods, forfeit 200*l.*, with costs; half to the king, and half to the officer who shall inform and prosecute.

And when the goods seized (being out of the limits of the bills of mortality) shall not exceed the value of 20*l.*, two justices may proceed to the condemnation thereof. And the proceedings, in all other respects, shall be in like manner as in the case of ribbands and laces above mentioned.

SILK, in *Chemistry*, deserves notice on account of a peculiar salt, or crystalline substance, obtained from it by the nitric acid. In its natural state, or before it is bleached, it contains a yellow resinous matter, from which it derives its fine golden colour. When raw silk is infused in water, a portion of gummy matter is dissolved, and a light amber-coloured liquor is produced. Pure alcohol extracts a much deeper yellow colour, and makes a tincture, that loses none of its colour by long exposure to the sun, which bleaches the silk itself. Nitrous acid acts powerfully on silk, in proportion to its concentration. If two drachms of this acid are mixed with a pint of alcohol, and silk, either raw or bleached, be immersed in it, and kept in digestion, in a moderate warmth, for twenty-four hours, the silk becomes of a dull yellowish-brown, which, after rinsing and washing with soap, and drying, turns to a fine golden yellow, which is very permanent. But when concentrated nitric acid is distilled off silk, and the remaining liquor duly evaporated, much oxalic acid is obtained; and the residue, if evaporated still further, yields, together with a little remaining oxalic acid, a quantity of yellow granular crystals, very bitter, not acid, and staining the saliva and hands of a very deep yellow, not easily removed. If the liquor is previously saturated with potash, and evaporated, another yellow silky salt evaporates, which detonates on coals like common nitre, and appears to be a triple combination of the former bitter substance with nitrate of potash. The first mentioned granular crystals, examined with a magnifier, appear to be composed of truncated octohedrons.

The above curious substance was discovered by Welter, and called by him the "bitter principle." He supposes it to be generally produced by the action of nitric acid on animal matters; and it is perhaps the same substance which causes the bitterness of bile. Aikin.

The spirit of raw silk, rectified with some essential oil, is the medicine commonly known by the name of *Gutta Anglicana*, or English drops.

SILK, *Spider*. Within about a century the secret has been found in France, of procuring and preparing silk from the webs of spiders; and the using it in several manufactures has been attempted. This discovery is owing to M. Bon, in 1710, who published a dissertation on the subject, whence what follows is extracted.

Spiders are usually distinguished, either with regard to their colour, as into black, brown, yellow, white, &c. or with regard to the number, or arrangement, of their eyes; some having six, others eight, others ten. But with regard to the silk-spiders, M. Bon reduces them all to two kinds; those with long legs, and those with short: which last are those which furnish the finest raw silk. The silk-spider makes a silk every whit as beautiful, glossy, and strong, as the silk-worm: it spins it from the anus; around which are five papillæ, or small nipples; and behind these, two others, all muscular, and furnished with sphincters. These nipples serve as so many wire-drawing irons, to form and mould a viscous liquor, which, when dried in the air, after being drawn through them, makes the silk. Each of these nipples, M. Reaumur observes, consists of a number of less and insensible ones; which one may be convinced of by pressing a spider's belly between the fingers, to oblige the liquor to flow into the nipples; for by this means, applying the finger against the anus, several distinct threads will be drawn out through the several perforations of each nipple. The threads are too fine to be counted with any certainty; but M. Reaumur reckons each larger nipple may send forth a great many.

Hence we see how the spiders make their threads bigger or smaller: for as, before they begin to spin, they always apply more or fewer of these nipples against the body whence the web is begun; or, as they apply each more or less strongly; so, as more or fewer of the minuter nipples come to take, the thread thus spun will be a compound of more or fewer of the single threads. Indeed, as the threads come from the anus all joined together, they appear to be single; but M. Bon has distinguished one of the single ones to consist of fifteen or twenty distinct threads.

The threads are of two kinds: the first is weak, and only serves for that kind of web with which they catch flies. The second is much stronger, and serves to wrap up their eggs in; which, by this means, are sheltered from the cold, as well as from insects, which might otherwise gnaw and destroy them. These threads they wind very loosely round the eggs, resembling the balls or bags of silk-worms, that have been prepared and loosened for the distaff.

The spider-bags are of a grey colour, when new; but they turn blackish, when long exposed to the air: indeed, one might find other spiders' bags of other colours, and which would afford a better silk; but their scarcity would render the experiment difficult: for which reason, we confine ourselves to the bags of the most common spiders, which are the short-legged kind. These always find out some place, secure from the wind and rain, to make their bags; as hollow trees, the corners of windows, or vaults, or under the eaves of houses.

By collecting a quantity of these bags, a new silk is made, inferior in nothing to the common silk. It takes all kinds of dyes, and may be made into all kinds of stuffs. M. Bon had stockings and gloves made of it, which he presented to the Academy, and others to our Royal Society.

For the manner of preparing the bags to get the silk, it is thus: after having gathered twelve or thirteen ounces of these bags, M. Bon had them well beaten for some time, with the hand, and a stick, to get out all the dust; he then washed them in lukewarm water, till they left the water very clean: after this, he laid them to steep, in a large vessel, with soap, and saltpetre, and gum arabic. The whole was left to boil, over a gentle fire, for three hours. The bags were next washed in warm water, to get out the soap; and after all, laid to dry some days, to fit them for

for carding; which was performed by the common filk-carders, but with cards much finer than ordinary. By this means, he had a filk, of a very particular ash-colour, which was easily spun; and the thread spun from it was both stronger and finer than that of common filk; which shews, that all sorts of works may be made of it: nor is there any reason to fear, but it will stand any trials of the loom, after having passed that of the stocking-weavers.

The only difficulty, now, is in procuring a sufficient quantity of spider-bags to make any considerable work of it; which, M. Bon observes, would be no difficulty at all, had we but the art of breeding them, as we do filk-worms; for they multiply much more; every spider laying six or seven hundred eggs, whereas the filk-worms do not lay above one hundred: yet are these last so tender, &c. that one half die without making any bags, or are hindered, by some little accident, from making them; whereas the spiders hatch of themselves, without any care, in the months of August and September, in fifteen or sixteen days after they are laid; the old spiders that lay them dying soon after. The young ones thus bred live ten or twelve months without eating, and continue in their bags without growing, till the hot weather, putting their viscid juices in motion, induces them to come forth, spin, and run about to seek food. Were a method, therefore, found of breeding young spiders in rooms, they would, doubtless, furnish a much greater quantity of bags than filk-worms do. For of seven or eight hundred young spiders, which M. Bon kept, hardly one died in a year; whereas of one hundred filk-worms, not forty lived to make their bags. M. Bon, having ordered all the short-legged spiders that could be found in the months of August and September to be brought to him, shut them up in paper coffins, and pots; covering the pots with papers, which he pricked full of pin-holes, as well as the coffins, to give them air. He fed them with flies, and found, some time afterwards, that the greatest part of them had made their bags. The same ingenious person found, that spiders' bags, with regard to their weight, afford much more filk than those of the filk-worms: as a proof of which, he observes, that thirteen ounces yield near four ounces of clear filk, two ounces of which will make a pair of stockings; whereas stockings of common filk weigh seven or eight ounces.

Nor is there any venom in the filk, or even in the spider, as many have imagined. M. Bon has been bit by them several times, without any manner of harm; and as for the filk, it is used with very good success to stop bleeding, and cure wounds, the natural gluten of it acting as a kind of balsam. It likewise yields, by distillation, several specific medicines, particularly great quantities of spirit, and volatile salt, which being prepared after the same manner as that drawn from the bags of filk-worms, in making the *guttæ Anglicanæ*, or English drops, at one time so famous all over Europe, may serve to make other drops of greater efficacy, which M. Bon calls drops of Montpellier, and advises to be used in all sleepy diseases.

M. Reaumur, being appointed by the Royal Academy to make a farther inquiry into this new filk work, has raised several objections and difficulties against it; which are found in the Memoirs of the Academy for the year 1710. The sum of what he has urged amounts to this. The natural fierceness of the spiders renders them unfit to be bred and be kept together: four or five thousand being distributed into cells, fifty in some, one or two hundred in others, the big ones soon killed and eat the less, so that, in a short time, there were scarcely left one or two in each cell; and to this

inclination of mutually eating one another, M. Reaumur ascribes the scarcity of spiders, considering the vast number of eggs they lay.

But this is not all: he even affirms, that the spider's bag is inferior to that of the filk-worm, both in lustre and strength; and that it produces less matter to be manufactured. The thread of the spider's web, he says, only bears a weight of two grains without breaking; and that of the bag bears thirty-six. The latter, therefore, in all probability, is eighteen times thicker than the former; yet it is weaker than that of the filk-worm, which bears a weight of two drachms and a half: so that five threads of the spider's bag must be put together, to equal one thread of the filk-worm's bag.

Now it is impossible these should be applied so justly over one another, as not to leave little vacant spaces between them, whence the light will not be reflected; and of consequence, a thread, thus compounded, must fall short of the lustre of a solid thread. Add to this, that the spider's thread cannot be wound off, as that of the filk-worm may, but must of necessity be carded; by which means, being torn in pieces, its evenness, which contributes much to its lustre, is destroyed. In effect, this want of lustre was taken notice of by M. de la Hire, when the stockings were presented to the Academy.

Again: spiders furnish much less filk than the worms: the largest bags of these latter weigh four grains; the smaller, three grains; so that 2304 worms produce a pound of filk. The spider-bags do not weigh above one grain; yet when cleared of their durt and filth, they lose two-thirds of their weight. The work of twelve spiders, therefore, only equals that of one filk-worm; and a pound of filk will require at least 27,648 spiders. But as the bags are wholly the work of the females, who spin them to deposit their eggs in, there must be kept 55,296 spiders to yield a pound of filk. Yet will this only hold of the best spiders; those large ones ordinarily seen in gardens, &c. scarcely yielding a twelfth part of the filk of the others: 280 of these, he shews, would not yield more than one filk-worm; 663,552 of them would scarcely yield a pound.

SILK-Grass, in *Botany*, a name used for two very different genera of plants, the aloe, and dog's bane.

SILK-Tail, or *Bohemian Chatterer*, in *Ornithology*. See *ROLLER*.

SILK, Virginian, in *Botany*. See *PERIPLOCA*.

SILK-Worm, Bombyx. This insect, which is a species of the phalæna, (see *BOMBYX*.) consists of eleven rings, and each of these of a great number of other smaller ones, joined to each other; and the head, which terminates these rings, is furnished with two jaws, which work and cut the food, not by a perpendicular but a lateral action.

The humours found in the body of this creature all seem approaching to the nature of the filk which it spins; for on being rubbed in the hands, they leave a hard or solid crust behind them. Under the skin there is always found a mucous rosy-coloured membrane, enveloping the animal, and supposed to be the new skin in which it is to appear, on throwing off the old one. The heart of this creature reaches from the head to the tail, running the whole length of the body; it is, indeed, rather a series of many hearts connected together, than one: the motion of systole and diastole is very evident in this whole chain of hearts; and it is an elegant sight to observe the manner of the vital fluid's passing from one of them to the other. The stomach of this animal is as long as the heart, reaching, like it, from one end of the body to the other. This large receptacle for food, and the sud-

den passage of it through the animal, are very good reasons for its great voracity.

In the sides of the belly, all about the ventricle, there is deposited a vast number of vessels, which contain the silky juice: these run with various windings and meanders to the mouth, and are so disposed, that the creatures can discharge their contents at pleasure at the mouth; and according to the nature of the juices that they are supplied with, furnish different sorts of silk from them, all the fluid contents of these vessels hardening in the air into that sort of thread, of which we find the web or balls of this creature consist.

These creatures never are offended at any stench, of whatever kind; but they always feel a southern wind, and an extremely hot air always makes them sick. Malpighi de Bombyce.

SILKEBURG, in *Geography*, a town of Denmark, in North Jutland, with a castle, which was formerly very strong; 18 miles W. of Aarhus.

SILLA, in *Ancient Geography*, a river of India, which rose in a mountain of the same name, and lost itself in the ground, without receiving any other river.

SILLA, in *Geography*, a large town of Africa, in Bambarra, on the right bank of the Niger, within two short days' journey of Jenné, which is situated on an island in the river. This place was the boundary of Mr. Park's journey, and from hence he began his return homeward; 75 miles N.E. of Sego. N. lat. $14^{\circ} 48'$. W. long. $1^{\circ} 34'$.

SILLA Point, a cape on the north-west coast of the island of Mindanao. N. lat. 9° . E. long. $123^{\circ} 51'$.

SILLABAR, or CELLEBAR, a sea-port town on the west coast of the island of Sumatra, with a good and safe harbour; 30 miles S.S.E. of Bencoolen.

SILLAH-MEW, a handsome town of the Birman empire, situated on the Irawaddy. It is shaded by wide-spreading trees, and embellished with several temples. A smooth bank sloping to the river, and clothed with the finest verdure, adds much to its beauty. The soil around in general is but poor. Some fields are regularly fenced, and cattle in large herds graze in the neighbourhood.

SILLANGER, a town of Sweden, in Angermanland; 4 miles W. of Hernösand.

SILLANO, a town of Etruria; 8 miles S.S.E. of Volterra.

SILLEE, a circar of Bengal, bounded on the north by Ramgur, on the east by Pachete, on the south by Tomar, and on the west by Nagpour; its form is square, and each side is about 16 miles.—Also, the capital of the above circar; 25 miles S.E. of Ramgur. N. lat. $23^{\circ} 22'$. E. long. $85^{\circ} 56'$.

SILLEIS, in *Ancient Geography*, a river of the Troade.

SILLE-LE-GUILLAUME, in *Geography*, a town of France, in the department of the Sarthe, and chief place of a canton, in the district of Le Mans; 18 miles N. of Le Mans. The place contains 2121, and the canton 11,835 inhabitants, on a territory of $247\frac{1}{2}$ kilometres, in 10 communes. N. lat. $48^{\circ} 12'$. W. long. $0^{\circ} 3'$.

SILLEWOOD, a small island in the North sea, near the coast of Norway; 30 miles N.N.W. of Bergen.

SILLINGA, a town of Bengal; 35 miles S. of Doesa.

SILLON, in *Fortification*, an elevation of earth, made in the middle of the moat, to fortify it, when too broad.

The fillon is more usually denominated an *envelope*.

SILLS, in *Agriculture*, a term signifying the shafts of a cart, waggon, &c.

SILLY, in *Geography*, a rock on the south coast of the island of Jersey; 2 miles S. of Noirmont Point.

SILLYUS, in *Ancient Geography*, a town of Asia Minor, in Ionia, in the vicinity of Smyrna.

SILM, or CILM MONOU, in *Geography*, a country of Africa, near the river Scherbro.

SILNO, a town of Lithuania; 4 miles N.N.W. of Grodno.

SILO, in *Ancient Geography*. See SKILOH.

SILLOE, SILOA, or Siloam, a fountain at the foot of the walls of Jerusalem, east, between the city and the brook Kidron, or Cedron. Josephus (De Bell. l. v. c. 26.) says, that when Nebuchadnezzar besieged Jerusalem, the waters of this fountain increased; and that the case was the same, when Titus besieged the city; so that, during the siege, it abundantly supplied the Roman army, and furnished also a sufficiency for watering the gardens; though, before this event, water could hardly be bought for money. The prophet Isaiah (ch. viii. 6.) insinuates, that its waters flowed gently and without noise. St. John speaks of the pool of Siloam. (John, ix. 7.) The tower of Siloam, mentioned Luke, xiii. 4. is thought to have been near the fountain.

SI-LONG, in *Geography*, a city of China, of the second rank, in Quang-si. N. lat. $24^{\circ} 34'$. E. long. $105^{\circ} 18'$.

SILLOOR, a town on the north-east coast of Sumatra. S. lat. $1^{\circ} 8'$. E. long. $103^{\circ} 51'$.

SILOXERUS, in *Botany*, so named by Labillardiere, from *συλος*, the style, and *ογκος*, swelling, on account of the tumid base of that part. It would have been difficult to trace this derivation, without authentic information from the author himself.—Labill. Nov. Holl. v. 2. 57.—Class and order, *Syngenesia Polygamia-segregata*. Nat. Ord. *Compositæ nucamentaceæ*, Linn. *Corymbiferae*, Juss.

Gen. Ch. Common calyx scarcely any, except the leaves surrounding the common compound receptacle; partial inferior, of from five to seven equal, obovate-oblong, concave, membranous leaves, containing several florets. Cor. compound uniform, discoid, of from two to five tubular, monopetalous, regular, pitcher-shaped, five-toothed, perfect florets. Stam. Filaments in each floret five, very short; anthers linear, united into a tube. Pist. Germen in each floret inversely pyramidal, tuberculated; style awl-shaped, swelling very much at the base; stigmas two, obtuse, spreading. Peric. none, except the permanent partial calyx. Seeds solitary to each floret, inversely pyramidal, beset with rows of tubercles, and crowned with about twelve little teeth; down of one leaf, membranous, pellucid, in five ovate, acute, fringed lobes. Common Receptacle oblong, somewhat club-shaped, hairy, many-flowered; partial small, scaly, the scales membranous, oblong, scarcely longer than the florets.

Ess. Ch. Common receptacle hairy; partial chaffy. Partial calyx with from two to five perfect, equal, regular florets. Seed-down membranous, five-lobed, fringed.

1. *S. humifusus*. Labill. Nov. Holl. v. 2. 58. t. 209.—Native of Lewin's land, on the south coast of New Holland. A small, diffuse, herbaceous plant, with a tapering, apparently annual, root. Stems several, spreading, simple, leafy, an inch or two long. Leaves mostly opposite, simple, linear, obtuse, smooth, near an inch in length; several of them crowded under the heads of flowers, which are terminal, solitary, ovate or nearly globular, scarcely an inch long. Nothing is mentioned concerning the colour, scent, or properties of this little inconspicuous, but singular, plant.

SILPERRY, in *Geography*, a town of Bengal; 2 miles S.S.E. of Ghidore.

SILPHA,

SILPHA.

SILPHA, in *Entomology*, a genus of insects of the order Coleoptera, of which the generic character is, Antennæ clavate, the club perfoliate; shells margined; head prominent; thorax somewhat flattened and margined. This genus of insects, from its habits, is known by the trivial name of the *Carrion-beetle*. The several species are commonly found among decayed animal or vegetable substances, frequenting also dung-hills, carrion, and other offensive matter: they lay their eggs chiefly in the dead and putrid carcases of animals. The larvæ are of a lengthened shape, and of an unpleasant appearance, being generally roughened with minute spines and protuberances. There are about 120 species, in eight separate divisions or sections. The following are most worthy of notice.

Section A is characterised by a dilated and bifid Lip, and a one-toothed Jaw; in which, among others, are the following

Species.

SURINAMENSIS. Black; shells with a yellow band behind; hind-thighs toothed. It is found in South America.

* **LITTORALIS.** This is a black insect; the shells are naked, with three raised lines; thorax rounded and polished. This is an European insect, and found in our own country.

LIVIDA. This is brown; thorax, shells, and legs livid. It is found in Germany.

INDICA. This, as its name imports, is an Indian insect; it is black; the shells are marked with two ferruginous bands; thorax one-toothed before.

MICANS. Black, with a green polish; shells striate, truncate, one-toothed. This is an inhabitant of the Cape of Good Hope. Tail rufous; shells black, with three elevated striae, one-toothed at the future.

AMERICANA. This, as its name shews, is found in divers parts of America. It is depressed and black; thorax is yellow and black in the centre. The shells are rugged and immaculate.

* **THORACICA.** This is black; the shells are marked with a single elevated line; the thorax is testaceous. This and the following are English insects. According to Mr. Donovan's figure and description, the shells of this species have three raised lines. It is distinguishable by its red thorax, every other part being black.

* **RUGOSA.** Blackish; the shells are ridged with three raised lines, the thorax is ridged and sinuate behind. This insect consumes dead carcases, fish, and flesh of all kinds: when caught it emits a very fetid humour.

* **ASTRATA.** This is of a size similar to the thoracici, but is totally black, and has the wing-sheaths marked by three rising lines; its larva, which may be found in gardens, is of a lengthened shape, and of a black colour.

* **LEVIGATA.** Black; shells smooth and sub-punctured. The shells are without raised lines.

* **OBSCURA.** Black; the shells are punctured, with three raised lines; the thorax is truncate before. This species is figured by Donovan. The thorax has a blueish gloss.

* **OPACA.** This is brown; the shells have three raised lines; the thorax is truncate before.

* **SINUATA.** The thorax of this species is emarginate and rough; the shells have three raised lines, sinuate at the tip. This is a beautiful species: the thorax is brown, with a silvery gloss; it is rough, with raised dots.

* **4-PUNCTATA.** The thorax is yellow, with a large black spot; the shells are yellow, with four black spots.

* **GRISEA.** Grey; the shells are smooth; the thorax is emarginate.

Section B is distinguished by an entirely rounded Lip, and a one-toothed Jaw.

4-MACULATA. Thorax and shells black, the latter with two rufous spots; the body is rufous: the antennæ are ferruginous, brown before the tip, shells striate.

MULTIPUNCTATA. Rufous; shells substriate, with numerous rufous dots. This is found chiefly in Sweden.

PICEA. Pitchy; shells striate, black, the base and band behind are ferruginous. This is a very small insect, and is found in Germany.

METALLICA. This is of a brassy colour; the legs are ferruginous. It is found in divers parts of Saxony.

C. Lip horny, entire; the Jaw is bifid.

4-NOTATA. Black; the shells are truncate, with two rufous spots. It is found in some parts of Germany. The antennæ are long; the five last joints are perfoliate; the shells are a little shorter than the body; the abdomen is acute.

4-PUSTULOSA. Black, polished; edge of the thorax and spots on the shells are fanguineous. It is found in New Holland; the shells are truncate, shorter than the abdomen.

AGARICINA. This also is black and polished; the antennæ and legs are yellow. It is found in many parts of Europe, but not in our own country. The shells are truncate, shorter than the abdomen; the body is black and immaculate; the abdomen pointed.

D. Lip emarginate, conic; Jaw bifid.

FASCIATA. Black; the shells are marked with two rufous bands, the fore one spotted with black. It inhabits North America, and is a rather large insect; though less than the

GRANDIS, which is an African insect, and so named on account of its size. This is black, and the shells are marked with two rufous spots.

* **4-PUSTULATA.** Black; the shells are marked with two ferruginous dots. This is found in England, and in many other parts of Europe. The larva is long, hairy, and grey.

* **6-PUSTULATA.** Black; shells striate, with three rufous spots. This is found chiefly in the northern parts of Europe. It is reckoned a very beautiful species; the antennæ are pitchy; the thorax is ferruginous at the edge; spot at the base of the shells sinuate, the middle one is uniform; that at the tip is small and round; the body beneath is rufous.

* **NIGRIPENNIS.** Rufous; the antennæ, shells, and breast are black. This is found chiefly on trees.

* **RUFIPES.** This is a black insect; the head, thorax, and legs, are ferruginous. The abdomen is black.

* **ÆNEA.** This is of a fine scarlet colour; the shells are brassy and immaculate.

* **RUFIFRONS.** Black; but the front, two spots on the shells, and legs, are ferruginous. This is found in divers parts of England, and is reckoned a small insect.

E. The Insects of this Section are characterised by a heart-shaped Lip, emarginate and crenate.

* **GERMANICA.** Black; front and edge of the shells are ferruginous. Sometimes the shells are marked with a ferruginous spot or two. It deposits its eggs in the carcases of other insects, and buries them under ground. It is very like the

* **VESPILLO.** This insect, which is not uncommon in our

own country, is the most remarkable of the European species. It is distinguished by having the wing-sheaths considerably shorter than the abdomen, or as if cut off at the tips; they are also marked by two waved, orange-coloured transverse bars, the rest of the insect being black; the general length of the animal is about three-quarters of an inch. The vespillo seeks out some decaying animal substance in which it may deposit its eggs, and in order to their greater security, contrives to bury it under ground. Three or four of these insects, working in concert, have been known to drag under the surface the body of a mole in the space of an hour, so that not a trace of it has appeared above ground. The eggs are white, and of an oval shape: from these are hatched the larvæ, which, when full grown, are about an inch long, of a yellowish-white colour, with a scaly orange-coloured shield; or bar, across the middle of each division of the body. Each of these larvæ forms for itself an oval cell in the ground, in which it changes to a yellowish chrysalis, resembling that of a beetle; out of which, in the space of three weeks, proceeds the perfect insect. This species is reckoned very elegant in form, but it generally diffuses a very strong and unpleasant smell; it flies with strength and rapidity, and is usually seen on the wing during the hottest part of the day.

MORTUORUM. Black; shells marked with two ferruginous bands; the club of the antennæ is black; the hind-thighs are unarmed. This is found in many parts of Germany, preying on carcases and fungi.

F. *Lip square and emarginate.*

* **SCARABÆOIDES.** Oval, black; the shells are marked with two ferruginous spots.

LUNATA. Oval, black; shells with a lunate yellow spot at the tip. It is about the size of the last, and is found in Germany.

COLON. Yellow; the spots on the thorax, and marginal spot on the shells, black. It is found in Sweden. The head is black; the antennæ are yellow; the club is black; the thorax is downy, with six spots disposed in a streak; the abdomen is black, edged with yellow.

* **ATOMARIA.** This insect is smooth and black; the shells have crenate striæ; the legs are pale.

* **MELANOCEPHALA.** This is black and smooth; the shells are grey, with a common black spot at the base.

* **UNIPUNCTA.** This is black; shells yellowish, with a common black spot. The shells are sometimes immaculate.

* **FIMETARIA.** Black, immaculate; the shells are very smooth. It is found chiefly in dung.

* **MINUTA.** This is black and small; the shells are striate; legs of the same colour. It is found in many parts of England.

* **PULICARIA.** This is oblong and black; the shells are abbreviated; the abdomen pointed. This is found chiefly among flowers.

G. *The Insects of this Section have a long and entire Lip; the Antennæ are serrate.*

* **SAXICORNIS.** Smooth, polished, and of a chestnut colour; the antennæ are black.

DEPRESSA. Smooth, ferruginous; the shells are sub-striate, and the body is depressed. It is found under the bark of oak-trees.

H. *Lip and Jaw unknown.*

Of this section there are no English species; it will be sufficient to mention the following.

INSIGNITA. Black; shells obsoletely striate, with two large scarlet spots. Common at Berlin; as is the next.

NIGRICANS. Blackish; the shells are smooth, with four yellow spots.

HISTEROIDES. Black; the antennæ and legs are red; the shells are abbreviated with a red spot. It inhabits Upsal, and is the size of a louse.

SILPHIUM, in *Botany*, an old Latin name adopted from the Greeks, whose *σιλπιον*, according to the description in Dioscorides, is evidently one of the umbelliferous family, with a broad or flat seed. (See **LASER**.) Linnæus takes a great liberty, in transferring this name to a syngeneous genus, altogether American, in his *Corollarium* Gen. Pl. 16; nor does he, in his *Hortus Cliffortianus*, give any reason for this measure.—Linn. Gen. 444. Schreb. 580. Willd. Sp. Pl. v. 3. 2330. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 163. Pursh 577. Juss. 118. Lamarck Illustr. t. 707. Gærtn. t. 171. (Afterifcus; Dill. Elth. 32. t. 47.)—Class and order, *Syngenesia Polygamia-necefaria*. Nat. Ord. *Compositæ oppositifolia*, Linn. *Corymbifera*, Juss.

Gen. Ch. *Common Calyx* ovate, imbricated, squarrose; its scales ovate-oblong, reflexed for about half their length, projecting on all sides, permanent. *Cor.* compound, radiant. Perfect florets in the disk several, of one petal, funnel-shaped, five-toothed; their tube scarcely more slender than the limb; female ones, in the radius, fewer, lanceolate, very long, often three-toothed. *Stam.* in the florets of the disk only, Filaments five, capillary, very short; anthers united into a cylindrical tube. *Pist.* in the florets of the disk imperfect, Germen thread-shaped, very slender; style thread-shaped, very long, villous; stigma simple: in the females, Germen inversely heart-shaped; style simple, short; stigmas two, bristle-shaped, the length of the style. *Peric.* none, except the unaltered calyx. *Seeds* in the disk none; in the radius solitary to each floret, somewhat membranous, inversely heart-shaped, with a membranous, two-horned, emarginate border. *Recept.* chaffy, with linear scales.

Eff. Ch. Receptacle chaffy. Seeds compressed, inversely heart-shaped, bordered; their down bordered, with two horns. *Calyx* squarrose.

Fifteen species are defined by authors, hardy herbaceous perennial plants, generally rather large, with the aspect of sunflowers; their leaves opposite, whorled, or alternate; the flowers yellow. The horns of the seed are wanting in some of the species.

1. *S. laciniatum.* Jagged-leaved Silphium. Linn. Sp. Pl. 1301. Ait. n. 1. Pursh n. 1. Linn. fil. fasc. 1. 5. t. 3.—Stem hispid. Radical as well as stem-leaves pinnatifid; their segments deeply toothed.—On the banks of rivers, in the western territories of North America, particularly on the Mississippi, flowering from August to October. *Pursh.* Collinson sent the seeds to Linnæus. The stem is from eight to twelve feet high, simple, leafy, round, an inch thick, rough in the upper part with bristly hairs. *Leaves* alternate, stalked, two feet long, and one broad, with four or five remote lobes at each side; strongly ribbed, rough. *Flowers* four inches wide; the ten scales of their rough calyx armed with strong taper points.

2. *S. compositum.* Panicked Silphium. Michaux Boreal Amer. v. 2. 145. Willd. n. 2. Pursh n. 2. (*S. laciniatum*; Walt. Carol. 217.)—"Stem smooth. Stem-leaves pinnatifid; radical ones ternate, with many segments. *Flowers* panicked."—In gravelly woods, near the sea-coast of Virginia and Carolina, flowering from August to October. Not above two feet high. *Flowers* small. *Pursh.*

SILPHIUM.

3. *S. terebinthinaceum*. Broad-leaved Silphium. Linn. Suppl. 383. Willd. n. 3. Ait. n. 2. Pursh n. 3. Jacq. Hort. Vind. v. 1. 16. t. 43.—Stem smooth. Radical leaves heart-shaped; those of the stem alternate, ovate, serrated, rough.—In Louisiana, and the western mountains of North America, flowering from August to October. *Pursh*. The stem is about five feet high, panicled at the top, with bright yellow, rather drooping, flowers, three inches in diameter. The radical leaves are a foot long, and nearly as broad, coriaceous, rough, sharply toothed, with very long footstalks.

4. *S. perfoliatum*. Square-stalked Silphium. Linn. Sp. Pl. 1301. Ait. n. 3. Pursh n. 4.—Leaves opposite, triangular, stalked, perfoliate. Stem square, smooth.—Native of the Alleghany mountains, from Pennsylvania to Carolina, flowering from July to October, according to Mr. Pursh, who considers as a variety of this the *conjunctum*, Willd. Enum. 933. The present is a robust plant, frequent in large gardens or plantations, taller than a man. Leaves rough like a file, with bordered rough-edged footstalks, clasping the stem with their compound bases. Flowers about two inches wide, with a smooth calyx.

5. *S. comatum*. Round-stalked Perfoliate Silphium. Linn. Mant. 574. Willd. n. 5. Ait. n. 4. Pursh n. 5.—Stem round, hispid. Leaves opposite, distantly serrated, rough; combined at the base.—Found on the high mountains of Virginia and Carolina, flowering in August and September. Pursh, as well as Willdenow, justly insists on this being a very distinct species from the last, of which Michaux thought it a variety. The stem is round, covered in the upper part with deflexed bristly hairs. Upper leaves nearly entire, broad and perfoliate at the base. The flowers resemble those of the preceding.

6. *S. afterifcus*. Hairy-stalked Silphium. Linn. Sp. Pl. 1302. Ait. n. 5. Pursh n. 6. (*Afterifcus coronæ folis folio et facie*; Dill. Elth. 42. t. 37.)—Stem round, hispid. Leaves opposite or alternate, oblong, acute, serrated, rough. Calyx fringed.—In mountain meadows of Virginia and Carolina, flowering from July to September. *Pursh*. Stem about two feet high, spotted with purple. Lower leaves alternate, coarsely toothed; upper nearly opposite, and more entire. Flowers nearly three inches broad.

7. *S. pumilum*. Dwarf Silphium. Michaux Boreali-Amer. v. 2. 146. Willd. n. 7. Pursh n. 7.—“Stem finely downy. Leaves oval, slightly serrated, obtuse, rather downy. Scales of the calyx obovate, obtuse. Seeds without horns.”—Gathered in Florida, by Bartram and Michaux. We have seen no specimen.

8. *S. integrifolium*. Entire-leaved Silphium. Michaux ibid. Willd. n. 8. Pursh n. 8.—“Stem quadrangular, harsh. Leaves opposite, sessile, oblong, entire, rough. Flowers on short stalks.”—On the most western of the Alleghany and Illinois mountains, flowering from August to October. About four feet high. Leaves all uniform, erect; extremely rough on the upper side. Flowers few. *Pursh*, Michaux.

9. *S. levigatum*. Polished Silphium. Pursh n. 9.—“Stem simple, square, furrowed, smooth. Leaves opposite, sessile, ovate, pointed, minutely serrated, smooth on both sides; somewhat heart-shaped at the base. Scales of the calyx ovate, fringed.”—Gathered by Mr. Englen, in Georgia, North America, about two feet high. Flowers densely corymbose. *Pursh*.

10. *S. trifoliatum*. Rough Three-leaved Silphium. Linn. Sp. Pl. 1302. Willd. n. 9. Ait. n. 6. Pursh n. 10. (*S. ternifolium*; Michaux Boreali-Amer. v. 2. 146.

Chrysanthemum virginianum, foliis asperis, tribus ad genicula sitis; Morif. sect. 6. t. 3. f. 68.)—Stem with six angles, smooth. Leaves three in a whorl, ovato-lanceolate, rough, with unequal tooth-like serratures. Panicle three-forked.—On the high mountains of Virginia and Carolina, flowering in September and October. *Pursh*. Stem about six feet high, leafy, purplish, smooth to the touch. Leaves more or less accurately whorled, about three inches long and one broad, on short stalks; the floral ones entire. Flowers two inches in diameter. Calyx-scales broad, minutely fringed, smooth.

11. *S. ternatum*. Fringed Three-leaved Silphium. Willd. n. 10. Pursh n. 11.—“Stem cylindrical, smooth. Leaves three in a whorl, stalked, lanceolate, slightly and minutely toothed, roughish; fringed at the base: the upper ones scattered and sessile. Panicle forked. Calyx fringed.”—Retzius communicated to Willdenow a description of this, as a new species from North America, and Pursh saw a specimen in Mr. Lambert’s possession. The stem is said to be four feet high. Lowest, as well as the uppermost, leaves scattered; those of the panicle sessile, two together. Calyx-scales in four rows. Florets of the radius broader than in the last; but those of the disk are shorter. *Retzius*.

12. *S. atropurpureum*. Violet-stalked Silphium. Willd. n. 11. Pursh n. 12.—“Stem cylindrical, smooth. Leaves about four in a whorl, lanceolate, rough, nearly entire, almost sessile; fringed at the base; the upper ones scattered. Panicle forked.”—Willdenow was indebted to Retzius for this likewise, but Mr. Lyon is said to have met with it in Carolina and Georgia, flowering in August and September. Mr. Pursh, who had seen this plant alive, says it resembles the preceding, but is at first sight distinguished by the purple smooth stem. By the description of Retzius, the specimen of *S. trifoliatum* in the Linnæan herbarium should seem rather to belong to the present species. See its description above.

13. *S. tomentosum*. Downy Silphium. Pursh n. 13.—“Stem and footstalks downy. Branches single-flowered. Leaves alternate, heart-shaped, ovate, serrated, shaggy. Seeds without horns.”—Gathered in Georgia, by John Bartram, whose specimens are in Sir Joseph Banks’s herbarium. *Pursh*.

14. *S. elatum*. Tall Silphium. Pursh n. 14.—“Leaves alternate, stalked, heart-shaped, sinuated. Calyx-scales obtuse.” Native of Carolina. *Herb. Banks*.

15. *S. reticulatum*. Reticulated Silphium. Pursh n. 15.—“Leaves alternate, ovato-lanceolate, heart-shaped, serrated, bluntish, somewhat villous.”—Native of Florida. *Herb. Banks*.

S. solidaginoides, Linn. Sp. Pl. 1302, proves the same plant as *Rudbeckia oppositifolia*, Sp. Pl. 1280, under each of which names it lies in the Linnæan herbarium. It is also *Helianthus levis*, Sp. Pl. 1278, adopted from Gronovius; and is Willdenow’s *Bupthalmum helianthoides*, n. 19, to which last genus it had originally been referred by Linnæus in his *Hortus Upsalienfis*. Finally this plant is now called *Heliopsis levis* in Pursh, p. 563, after Perfoon. See *RUDBECKIA*.

S. trilobatum, Linn. Sp. Pl. 1302, is *Bupthalmum repens*, Willd. Sp. Pl. v. 3. 2233. n. 13. Lamarck Dict. v. 1. 515.

SILPHIUM, in Gardening, contains plants of the tall-growing, herbaceous, perennial kind, of which the species cultivated are, the jagged-leaved silphium (*S. laciniatum*); the broad-leaved silphium (*S. terebinthinaceum*); the hairy-stalked silphium (*S. afterifcus*); and the three-leaved silphium (*S. trifoliatum*).

Method of Culture.—They are all readily increased by parting the roots, and planting them out in the autumn or spring, where they are to remain in the borders and clumps. They may also be raised by planting the slips in the same manner: they should be afterwards managed as the perennial sun-flower. They are durable in the root, but decay annually in the stalk.

They afford a good variety and effect among other perennial plants in the summer season, when put out in a proper manner.

SILPHIUM, in *Ancient Geography*, a country of Libya, which took its name from the plant. It commenced eastward towards Aziris and the isle of Platæa, and extended westward as far as the Syrtis.

SILSTADT, in *Geography*, a town of Germany, in the county of Wernigerode; 3 miles N.E. of Wernigerode.

SILVA, a river of Russia, which runs into the Kama, near the town of Silva, in the government of Perm.—Also, a river of Russia, which runs into the Tchusovaia, 16 miles N.E. of Perm.—Also, a town of Russia, in the government of Perm; 12 miles N.W. of Solikamsk.

SILVA Piana, a town of Switzerland, in the bishopric of Coire; 16 miles W.N.W. of Bormio.

SILVANEZ, a town of France, in the department of the Aveyron; 9 miles S. of St. Afrique.

SILVELLA, a town of Italy, in the department of the Upper Po; 3 miles E.N.E. of Cremona.

SILVER, a river of the King's county, Ireland, which rises on the north-west side of the Sliebh-Bloom mountains, and takes a northerly direction. It has this name in Beaufort's and Arrowsmith's maps, but is called the Frankford river by Mr. Longfield, in his report to the Bog commissioners, from the small town of Frankford, which it passes. Mr. Longfield represents it as capable of being easily made navigable for canal boats, and also of being made to contribute to the drainage of the vast bogs between which it flows. In one part of its course, a little before it joins the Brufna, the Macartney aqueduct, a part of the Grand Canal, passes over it.

SILVER, in the *Arts, Manufactures and Commerce*, and in *Domestic Economy*, is a white malleable metal, susceptible of a fine polish. In *Chemistry*, it is a simple inflammable body.

It is sometimes found in the native state, but more frequently combined with antimony, arsenic, or sulphur; forming the varieties of silver-ores; with which we shall begin, and then proceed to the assay and analysis, physical properties, and chemical properties of silver.

Silver-ores contain that metal either native, or alloyed with other metals, or mineralized by sulphur, and sometimes with the muriatic acid, the sulphuric acid, and in one rare instance with the carbonic acid.

Silver-ores principally occur in the rocks which have been denominated primary and transition rocks, and rarely in secondary rocks; but many rich argentiferous lead-ores occur in alpine lime-stone and secondary strata. The ores of silver are accompanied by calcareous spar and sulphate of barytes, and sometimes with quartz, horn-stone, jasper, and fluor spar. It has been remarked, that the warmer regions of the globe afford the greatest quantity of gold, but the richest repositories of silver are situated either in high latitudes or in elevated regions. The most celebrated silver-mines of Europe are in Sweden and Norway, at no great distance from the polar regions; and those which are in warmer latitudes, are almost all situated near the summits of alpine mountains commonly covered with snow, as at Allemont in France, and the mines of Mexico and Peru, in

the centre of the Cordilleras. Silver never occurs, like gold, in alluvial soil, or the sands of rivers. After the mineralogical description of the ores, we shall give a short account of the principal repositories of silver at present known.

Native silver, *Argent natif* of Haüy, possesses the characters of silver extracted from other silver-ores, but is generally less malleable. The colour is pure white, but the surface is commonly tarnished, and is of a yellowish-brown or greyish-black. Native silver occurs crystallized in cubes and octohedrons; the crystals are small, and are often aggregated, forming beautiful ramifications; the branches sometimes cross each other in a rectangular direction, and are reticulated. It is sometimes in leaves and sometimes capillary, and when the filaments are much entangled, it becomes nearly compact. Native silver is also found in shapeless masses of considerable size. In the year 1750, there was found in the famous mine of Hemmels Furst, near Freyberg, in Saxony, a mass of native silver, which weighed one hundred weight and a quarter; in 1771 an equally large mass was found. It is also mentioned by Albin, in his "*Meissnische Berg Arconicke*," p. 30, "that at Schneeberg, in 1478, a rich silver vein was discovered; and so large a block of native silver cut out, that duke Albert of Saxony descended into the mine, and used this large block as a table to dine upon. It was melted into four hundred centners of silver: a centner is 110 lbs." (Jameson's Mineralogy.) Native silver is fusible into a globule, which is not altered by a continuance of the heat: it is scarcely ever pure: the metals with which it is alloyed are commonly gold, copper or arsenic, and iron. Native silver alloyed with gold is rare; its colour is intermediate between silver-white and brass-yellow; it often contains a considerable proportion of gold. The stones which form the matrix of native silver in the mine are very numerous; it sometimes appears to be infiltrated into the fissures, sometimes to vegetate on the surface, and in other instances to be intimately combined with the substance of the stone. It is found in almost all the silver-mines that are worked in Europe or America; but the masses discovered in America are not so large as some which have been found in Europe. The *pacos*, a most abundant ore in Peru and Mexico, consists of minute particles of native silver, intermixed with brown oxyd of iron; but the particles are too small to be seen without a lens, and bear but a very small proportion to the mass. Silver rarely occurs in detached grains, like gold or platina.

Antimonial silver-ore is composed of silver combined with antimony, without any other substance. Its colour is tin-white; it has a shining metallic lustre, which is often tarnished superficially reddish or yellowish. It is distinguished from native silver by its brittleness, being scarcely malleable: the structure is lamellar. It is commonly found crystallized in four-sided and six-sided prisms, having the sides deeply striated: its specific gravity is from 9.4 to 9.8. It melts easily before the blowpipe, giving a white smoke from the oxyd of antimony, and leaving a globule of silver. Its constituent parts are from .76 to .84 silver, and from 16 to 24 of antimony. Antimonial silver is rare, particularly the regular crystallizations of it. It occurs in veins with calcareous spar and sulphate of barytes, and is accompanied by galena and native silver. The foliated structure of antimonial silver distinguishes it from white cobalt-ore, which has a granular structure; it differs also from arsenical pyrites, both by its structure and softness; the latter is extremely hard. Antimonial silver yields to the knife.

Arsenical silver-ore is harder than the former species; its structure

SILVER.

structure is less perfectly lamellar, the fracture more even, and the lustre weaker. It occurs in small, globular, and kidney-shaped masses; before the blowpipe it yields the smell of garlic, peculiar to arsenic; a globule of silver more or less pure remains. The constituent parts of this ore are given by Klaproth as under;

Silver	-	-	16
Arsenic	-	-	35
Iron	-	-	44
Antimony	-	-	4

Arsenical silver-ore usually occurs with native arsenic; dark red silver-ore, brittle silver-glance, lead-glance, and brown blende, in calcareous spar. It is a scarce mineral.

Corneous silver-ore, or *Horn-ore*; *Argent muriaté*, Fr. This mineral is distinguished by its translucency; it has a waxy or glistening lustre, is soft and tenacious, and yields to the nail. From these characters it is supposed to bear some resemblance to horn, whence its name. The most common colours of this mineral are pearl-grey, passing into greenish or reddish-blue or brown; it acquires a brownish tarnish. Horn-silver occurs crystallized in small cubes, and is sometimes, though rarely, acicular and capillary: it is more commonly in laminæ or small masses, or forms a coating on native silver. It is fusible in the flame of a candle. Under the blowpipe, on charcoal, it yields a globule of silver, and gives out a disagreeable odour, from the escape of the muriatic acid. Its specific gravity is from 4.75 to 4.80. Horn silver-ore is accompanied with native silver, black silver-ore, brown oxyd of iron, quartz, and sulphate of barytes. It is supposed by some mineralogists to be the most recent formation of silver-ore. It occurs in veins in the silver-mines of Europe and America, and in Siberia, and is observed generally to occupy the upper part of the vein. According to Klaproth, it consists of 68 parts silver, 21 muriatic acid, a small quantity of sulphuric acid, with a portion of iron and earthy substances; but the latter may be considered as accidental. Horn-silver is rather a scarce mineral.

Vitreous silver-ore; *Silver-glance*, or *sulphuretted silver*; *Glaferz*, Werner; *Argent sulfuré*, Haüy. Its colour is a dark lead-grey; it is malleable, and may be cut with a knife; the surface, when cut, is shining, and has a metallic lustre; in its natural state it has often an iridescent tarnish. It occurs in a variety of forms, in branches, fibres, small irregular masses, and laminæ, and is also frequently crystallized: the crystals are commonly the cube or octohedron, and the dodecahedron, with rhomboidal faces: the fracture is flatly conchoidal. The specific gravity of this ore is from 7.0 to 7.2: its constituent parts are from 73 to 85 silver, and from 15 to 25 of sulphur. When raised to a red heat, the sulphur is gradually sublimed, and the silver appears in filaments, dendritical or reticulated. Many mineralogists suppose that capillary native silver owes its formation very frequently to a similar kind of decomposition of vitreous silver-ore. This mineral occurs in veins, and is always accompanied with other ores of silver, and with galena, iron pyrites, brown blende, sulphate of barytes, calcareous spar, and quartz. It is found in almost all silver-mines in various parts of the globe.

Brittle vitreous silver-ore; *Shrod glaferz*, Werner; *Argent noir*, Haüy; differs from the former by its brittleness, splendour, and colour. The colour is intermediate between iron-black and dark lead-grey; it is brightly splendid externally; internally it alternates from shining to glistening; the lustre is metallic. It occurs massive and disseminated, and in thin small plates, and frequently crystallized in six-sided prisms, variously terminated, and in rectangular four-

sided tables: the latter crystals frequently intersect each other, forming the cellular structure. The tabular crystals are generally minute. The fracture of the massive vitreous ore is uneven; that of the crystals imperfectly conchoidal. This ore is soft, brittle, and fusible by the blowpipe; the sulphur, arsenic, and antimony, are partly volatilized, and a globule of imperfectly malleable silver, accompanied with a brown scoria, remains. According to Klaproth, the brittle vitreous silver-ore, from a mine near Freyberg, contained

Silver	-	-	-	66.50
Sulphur	-	-	-	12
Antimony	-	-	-	10
Iron	-	-	-	5
Copper and arsenic	-	-	-	0.50
Earthy matter	-	-	-	1

Black sulphuretted silver-ore; *Silber schwarz*, Werner; differs from vitreous silver-ore by its want of lustre: it occurs massive, corroded, and in powder: the fracture of the former is uneven; the streak shining and metallic. It yields to the knife, and is fusible into a slag, containing globules of silver.

Red silver-ore, or *Ruby silver*; *Roth gilitgerz*, Werner; *Argent rouge*, and *Argent antimonie sulfuré*, Fr. The colours of this mineral are various shades of red, passing from a bright-red to dark-red, and reddish-grey or black. When scraped, the powder is of a crimson colour. The crystallized varieties are translucent, or semi-transparent, and the transmitted light is a carmine, light blood, or cochineal-red. It occurs massive, disseminated, and in thin plates, and crystallized in hexahedral prisms, variously terminated, and in dodecahedrons, with triangular faces, nearly similar to the crystallization of calcareous spar, called dog-tooth spar. The primitive form of the crystal, according to Haüy, is an obtuse rhomboid, whose plane angles are $104^{\circ} 28'$ and $73^{\circ} 22'$, and the inclination of the faces $109^{\circ} 28'$ and $70^{\circ} 32'$. The fracture is usually uneven, and imperfectly conchoidal; its lustre externally is shining and metallic, internally glimmering, sometimes metallic. It is brittle, soft, yielding easily to the knife. Before the blowpipe it gives out a copious smoke, with an arsenical smell, and leaves a globule of silver. Its specific gravity is about 5.6. There are several minerals which have a red colour, and may at first sight be confounded with red silver, as the sulphuret of arsenic, or realgar; but this mineral becomes yellow when powdered. Cinnabar has a greater resemblance, but the specific gravity is 7, and it is entirely volatilized by the blowpipe. Red oxyd of copper has a specific gravity of 3.9, and is usually accompanied with native copper, malachite, and brown iron ochre; it also effervesces with nitric acid, and communicates to a solution of ammonia a blue colour. By these characters it may be known from red silver-ore. Werner has divided red silver-ore into two sub-species, the light and the dark. Klaproth analysed this mineral, and found it to contain only silver, sulphur, antimony, and oxygen. Proust has shewn that there are two kinds of red silver-ore, the one containing arsenic, and the other antimony. The constituent parts, as given by Klaproth and Vauquelin, are

	Klaproth.	Vauquelin.
Silver	60	54.27
Antimony	20.3	16.13
Sulphur	11.7	17.75
Oxygen	-	11.85
Sulphuric acid	8	-

47.

According

SILVER.

According to the analysis of Proust, a variety of this ore contained nearly .75 parts of metallic silver, and .25 of metallic arsenic. Red silver-ore occurs in veins, but is always intermixed with other minerals, particularly with compact galena, cobalt, fulphuret of arsenic, native arsenic, grey copper-ore, and sparry iron-ore; and has a matrix of calcareous spar, sulphate of barytes, fluor spar, or quartz. It is a common ore in silver-mines, both in Europe and America: the dark-red ore is considerably more productive than the light-red.

Silver amalgam consists of pure silver combined with mercury. It has been found in the silver-mine of Salberg, in the province of Dalecarlia, in Sweden, in the mines of Deux-Ponts, in the Palatinate, and in some other places, either in thin plates or grains, or crystallized into octohedrons and dodecahedrons. It is sometimes semi-fluid. Its colour is silvery-white or grey, the fracture conchoidal, and the lustre metallic. It is soft, breaks when cut, and whitens the surface of gold or of copper; when rubbed upon them warm before the blowpipe the mercury evaporates, and leaves the silver pure. The constituent parts, given by Klaproth, are

Silver	-	-	-	-	36
Mercury	-	-	-	-	64

White silver-ore has a near resemblance to compact galena. The colour is a light lead-grey, passing to steel-grey: it occurs massive and disseminated, and is generally intermixed with cubic galena. The fracture is most commonly even, but sometimes fine-grained and uneven, and also fibrous; the internal lustre is glistering and metallic; the streak shining. It is soft and brittle. The specific gravity is 5.3. Some mineralogists think this ore should be classed with the argentiferous ores of lead. According to Klaproth, different specimens from Hemmels Furt, near Freyberg, contain, of the

	Dark-white silver-ore.	Light-white silver-ore.
Lead	- 41	48
Silver	- 9.25	20.40
Antimony	- 21.50	7.88
Iron	- 1.75	2.25
Sulphur	- 22.0	12.25
Alumine	- 1.0	7
Silex	- 0.75	0.25

Carbonate of Silver.—This ore has hitherto been only discovered in the silver-mine of Winceslaus, in Swabia: it occurs sometimes in masses, and sometimes disseminated through other minerals. Its colour is a greyish-black; its fracture uneven, with a glistering metallic lustre; it is brittle and heavy, and effervesces with acids; it melts easily under the blowpipe. According to Mr. Selb, who first described this mineral, it contains

Silver	-	-	-	72.5
Carbonate of antimony	-	-	-	17.5
Carbonic acid	-	-	-	12

It contains also a slight trace of copper.

Besides the above ores of silver, there are ores of other metals which contain a portion of silver, and have been classed by some mineralogists with silver-ores. An argentiferous variety of grey copper-ore, of an iron-black or steel-grey colour, has received the name of black silver-ore. It occurs massive, disseminated and crystallized in tetrahedrons; the fracture is small conchoidal, with a shining metallic lustre; it is sectile and brittle. An ore which is a combination of lead, bismuth, and silver, has received the name

of bismuthic silver. Its colour is a light lead-grey: it occurs disseminated, but rarely ever in masses; the fracture is fine-grained, uneven, with a glistering metallic lustre; it is soft and rather brittle; before the blowpipe metallic globules appear on the addition of borax, which unite; the button is brittle, and of a tin-white colour: the flux acquires an amber colour. According to Klaproth this ore contains

Lead	-	-	33
Bismuth	-	-	27
Silver	-	-	15
Iron	-	-	4.3
Sulphur	-	-	16.3
Copper	-	-	0.9

Argentiferous lead-ores are common in Great Britain and in various parts of Europe. Many of these ores are not sufficiently rich to repay the expence of extracting the silver. It is procured in considerable quantities in North Wales, the north-west parts of Yorkshire, and in the counties of Durham and Northumberland. Indeed, many lead-ores in these counties contain a much larger portion of silver than the average proportion of that metal in the ores of Mexico and Peru; but mineralogists do not class them with silver-ores.

Silver Mines in Great Britain.—Silver-ores, properly so called, are of rare occurrence in our island. A few years since, a vein of silver was worked with great profit in the parish of Alva, in the county of Stirling, in Scotland. The ores were native silver, and vitreous silver-ore. From forty to fifty thousand pounds sterling value was extracted before the ore was exhausted, after which the search to recover the vein proved fruitless, and since that time no silver-mines have been worked in that country. The silver-ores at Alva were accompanied with copper, lead, and cobalt-ores, with a matrix of calcareous spar, and sulphate of barytes. It is supposed by Dr. Millar that the veins traverse rocks of argillaceous porphyry.

Cornwall and Devonshire yield the richest argentiferous lead-ores of any part of Great Britain; but the quantity of these ores is small. In the former county a small quantity of native silver, with other silver-ores, have been occasionally found. We have been favoured with the following account of the present state of the silver-mines in these counties from Mr. Mawe, author of *Travels in Brazil*, who visited them in the summer of 1815.

From the lead-mines of Ben-Alden, in Devonshire, a large quantity of silver has been extracted. The vein is situated in *killas*, (see SLATE,) and is filled chiefly with fluor spar and galena. It has been worked to the depth of 110 fathoms: the silver extracted from the north and south vein averages about 70 ounces to the ton of lead. Another vein, running in a more easterly and westerly direction, situated in the same *killas*, produces 170 ounces of silver in the ton of lead. The vein is worked under the river Tamar. These mines are of considerable importance; during the last six weeks, the silver extracted from the lead procured here exceeded six thousand ounces. The works are extensive, and said to be well conducted.

About four miles to the south-east of Callington is a silver-mine of another description: the vein is situated in a similar rock of *killas* or chlorite slate. The vein was first worked for copper, but native silver and lead-ore were discovered in it. The mine is called Huel Jewel: the thickness of the vein rarely exceeds three or four inches. In many of the cavities were found a considerable quantity of capillary native silver, with galena, red silver-ore, and sulphuret of silver.

SILVER.

silver. The ores were exceedingly rich, and promised at one time an ample recompence to the adventurers.

The Hurland copper-mine, near Redruth, has produced a considerable quantity of native silver in a small vein, branching from the principal vein. Some of the fibres of silver were more than four inches long.

There is a lead-mine near Truro worked at this time, and a considerable quantity of silver is extracted from the lead, as it yields 100 ounces *per ton*.

Near Peranzabula, on the north coast of Cornwall, there was a mine formerly worked close to the sea, which produced lead-ores in various states, and a portion of horn-silver, fine specimens of which are in various cabinets. Mr. Mawe found some specimens of this rare mineral among the refuse of the mine.

At Comb-Martin, in North Devon, are some lead-mines, which were formerly celebrated for the silver, but at present they are not productive.

Argentiferous lead-ores are the common lead-ores of the northern counties and of Wales; they vary in the quantity of silver they contain, from a few ounces to 40, 60, or 80 ounces of silver *per ton*. Some few rare instances have occurred in the north-west part of Yorkshire, of their exceeding the latter amount. On the average, the argentiferous lead that is calcined to extract the silver does not contain 20 ounces *per ton*: by some it has been stated at 17 ounces.

According to Lehman, there are no known lead-ores in the world but what contain silver, except that of Villoch, in Carinthia. (Lehman sur les Mines.) But according to Dr. Watson, the quantity of silver necessary to defray the expence of extracting, and the loss of lead, was nine ounces *per ton*, when lead was at the price of 15*l.* *per ton*. The price of lead is now 26*l.* *per ton*, and though silver be also advanced, yet the difference in the relative prices of each, taking the above as a standard, is such, that to repay the expence of extraction, the lead should contain about fifteen ounces of silver in every ton.

It is not to be expected that the proprietor of any lead-mines rich in silver should be forward in declaring to the world the quantity of silver they contain. The proprietor of the lead-mine containing silver may indeed work the same without any apprehension of its being taken from him under the pretence of its being a royal mine; yet the crown, and persons claiming under it, have the right of pre-emption of all the ore which may be raised. There was an act of parliament passed in the sixth year of William and Mary, entitled, An act to prevent disputes and controversies concerning royal mines. This act declared, that every proprietor of a mine of copper, tin, iron, or lead, should continue in possession of the same, notwithstanding its being claimed as a royal mine, from its containing silver or gold; but it is further enacted, that the crown, or persons claiming under it, should have the privilege of purchasing all the ore which should be raised out of such mine, at the following prices, when made clean and merchantable: for copper-ore, at the rate of 16*l.* *per ton*; for tin-ore, except that of Devonshire and Cornwall, 40*s.*; for iron-ore, 40*s.*; and for lead-ore, 9*l.* The standard price then fixed, particularly for lead, was much higher than the ordinary price of the ore in which there was no silver. Owing to the existence of this act, it is probable that we are not acquainted with the quantity of silver at present extracted annually. We are informed, that the value of silver produced by the lead-mines of colonel Beaumont, in Northumberland and Durham, is not less than 4000*l.* sterling *per annum*; and other large proprietors also extract a considerable quantity of silver from the lead-ores in

the northern counties. At present we believe that there is no silver extracted from the Derbyshire lead-ores.

It appears from Hollingshed's Chronicle, that silver was formerly extracted from lead in various parts of the island. In the reign of Edward I. 1600 pounds weight of silver was obtained in the course of three years, from a mine in Devonshire, which had been discovered towards the beginning of his reign: this mine is called a silver-mine by the old writers, but it appears to have been a mine of lead that contained silver. The lead-mines in Cardiganshire have at different periods afforded great quantities of silver: sir Hugh Middleton is said to have cleared from them two thousand pounds *per month*, and to have been enabled thereby to undertake the great work of bringing the New River from Ware to London. The same mines yielded, in the time of Charles I. eighty ounces of silver in every ton of lead, and part of the king's army was paid with this silver, which was minted at Shrewsbury. Sir J. Pettie's Essay on Metal Works.

A mint for the coinage of Welsh silver had been previously established at Aberystwith; the indenture was granted to Thomas Bushel, for the coinage of half-crowns, shillings, sixpences, twopences, and pennies, and the monies were to be stamped with the ostrich feathers on both sides. In 1604 nearly 3000 ounces of this Welsh bullion were minted at one time at the Tower. Webster, in his History of Metals, published in 1671, makes mention, from his own knowledge, of two places in Craven, in the West Riding of Yorkshire, where formerly good argentiferous lead-ore had been procured. One of the places was Bronghite Moor, in the parish of Slaidburn; the ore held about the value of 67 pounds of silver in a ton: the other was at Skelhornfield, in the parish of Gilsburn; it had formerly belonged to a person of the name of Pudsey, who is supposed to have coined it, as there were many shillings in that country which the common people called Pudsey shillings. There are several smelting-houses at Holywell, in Flintshire, where silver is extracted from lead. According to Mr. Pennant, at one of the largest of these houses in the year 1754, more than 12,000 ounces of silver were produced, but in the subsequent years the quantity of silver appears to have considerably diminished. The silver extracted from lead is sold principally to the manufacturers at Sheffield and Birmingham.

The silver is extracted from the lead by the oxydation of the latter metal in a reverberatory furnace of a particular construction, for the admission of air on the surface of the lead in a state of fusion.

A shallow vessel or cupel is filled with prepared fern-ashes rammed down, and a concavity cut out for the reception of the lead, with an opening on one side for the mouth of the bellows, through which the air is forcibly driven during the process. The French smelters cover the surface of the ashes with hay, and arrange symmetrically the pieces of lead upon it. When the fire is lighted, and the lead is in a state of fusion from the reverberation of the flame, the blast from the bellows is made to play forcibly on the surface, and in a short time a crust of yellow oxyd of lead, or litharge, is formed, and driven to the side of the cupel opposite to the mouth of the bellows, where a shallow side or aperture is made for it to pass over; another crust of litharge is formed and driven off, and this is repeated in succession till nearly all the lead has been converted into litharge and driven off. The operation continues about forty hours, when the complete separation of the lead is indicated by a brilliant lustre on the convex surface of the melted mass in the cupel, which is occasioned by the removal of the last crust of litharge that covered the silver. The French introduce water through a tube into the cupel, to cool the silver rapidly and prevent

SILVER.

its spirting out, which it does when the refrigeration is gradual, owing probably to its tendency to crystallize. In England the silver is left to cool in the cupel, and some inconvenience is caused by the spirting, which might be avoided by the former mode.

The silver thus extracted is not sufficiently pure; it is again refined in a reverberatory furnace, being placed in a cupel lined with bone-ashes and exposed to a greater heat: the lead which had escaped oxydation by the first process is converted into litharge, and absorbed by the ashes of the cupel.

The last portions of litharge in the first process are again refined for silver, of which it contains a part that was driven off with it. The litharge is converted into lead again, by heating it with charcoal; part is sometimes sold for a pigment, or converted into red lead. The loss of lead by this process differs considerably, according to the quality of the lead. The litharge commonly obtained from three tons of lead amounts to 58 hundred weight; but when it is again reduced to a metallic state it seldom contains more than 52 hundred weight of lead, the loss on three tons being about eight hundred weight. The Dutch are said to extract the silver from the same quantity of lead, with a loss of only six hundred weight.

Silver-Mines of France.—The mine of Allemont, ten leagues from Grenoble, in the department of Isere, is situated near the summit of a mountain, composed of thin beds of mica-slate and hornblende, curiously contorted and broken. Its elevation is about 3000 yards above the level of the sea. The veins are numerous, and run in all directions: the mineral appears to have filled also numerous fissures in the rock. The ores are native silver, vitreous silver, red silver-ore, and horn-silver. Silver appears also disseminated in a kind of ferruginous clay, and is accompanied with various ores of cobalt, antimony, arsenic, and nickel. The matrix was ferruginous clay and carbonate of lime, mixed with asbestos, epidote, and calcareous spar. The veins were much richer near the surface than at a great depth, and the working of this remarkable mine is at present nearly abandoned. Red silver-ore has also been found in the Vosges, in the department of the Upper Rhine, in a vein of argentiferous copper-ore. Indications of silver have been traced in other districts of France. The lead-ores of some parts of France are also sufficiently rich in silver to repay the expence of extraction.

The *silver-mines of Spain* are the most ancient known in Europe. It appears, as well from the accounts of historians, as from the numerous vestiges of ancient workings, that the operations were carried on to a considerable extent. The most remarkable mine was that at Guadalquivir, in Andalusia, in the Sierra Morena, five leagues to the north of Seville; the ore which it contains is the red or ruby silver, in a matrix of compact galena. Since the discovery of South America no attention has been paid to the mines of Spain, though formerly so productive both of silver and gold.

Germany.—The mining district of Freyberg, in Saxony, contains numerous veins that yield silver. The veins that traverse rocks of gneiss are generally composed of quartz, calcareous spar, and fluor spar; they inclose argentiferous lead, vitreous silver-ores, ruby silver, and grey argentiferous copper-ore. The mine at Annaberg, according to Klaproth, contains muriate of silver (horn-ore) mixed with much clay, which is imbedded in compact lime-stone. The mines of Schneeberg, in Misnia, and of Hartz, in Hanover, contain argentiferous lead, accompanied with proper silver-ores.

Hungary.—The mines of Schemnitz and Kremnitz, in Hungary, have been long celebrated, both for the richness of their productions and the immense extent of the opera-

tions. The rocks in which the mining operations are carried on, are described as being composed of an argillaceous grey-stone, mixed with quartz or schorl, or particles of calcareous spar. To this rock baron Born has given the name of the metalliferous rock, *saxum metalliferum*: it is described by him as containing three principal veins, running from north to south, and parallel with the river Gran, following even the windings of the river. From this circumstance we should infer, that the river itself had originally taken the course of a fracture by another vein. The dip or inclination of all the veins is from west to east, varying from 30 to 70 degrees. In one part of the vein, called the *spitaler vein*, it is joined with an argillaceous white vein, which runs along with it on the *hanging* side, and from the place of junction the vein is found to contain silver. In this white clay are occasionally found nodules of spar and masses of quartz, which yield from four to five ounces of silver in the hundred weight. The second great vein at Schemnitz has nearly the same characters as the first. The third great vein is more irregular in its inclination, and the ores are not so rich in silver, but in some parts it contains a considerable quantity of gold.

Some notion may be formed of the extent of the mining operations at Schemnitz, from the gallery or level called the Emperor Francis' Gallery, by which the whole of the royal mine is drained and cleared of water. This gallery, which forms a very considerable excavation, and is carried through hard rock, was a work of immense labour and difficulty; it is five English miles in length: it was begun in 1748, and finished in 1765.

The mountains round Kremnitz, according to baron Born, are composed of the same metallic rock already described; but according to Patrin, they consist of primitive trap. At this place very extensive operations, which were begun at least a thousand years ago, have been established on a large and rich gold vein, and some of its branches. The rock is a white solid quartz, mixed with fine auriferous red and white silver-ore, and with auriferous pyrites. At the depth of 160 fathoms, the vein continued rich and productive.

Königsberg is another mining-town of Hungary, some miles to the north-west of Schemnitz. The valley in which this place is situated is bounded on one side by the same kind of metallic rock, and on the other, towards the north, by granite mountains. In the royal mine, at the time it was visited by baron Born, the vein was observed to run between the metallic rock, which formed its *hanging* side, and the granite, which was its *hading* or lower side. The vein is grey quartz, mixed with auriferous pyrites. The first steam or fire-engine established in the Lower Hungarian mines was erected at Königsberg, in 1725, by Isaac Porter, an English engineer, who was then in the imperial service.

Bohemia.—The circle of Saatz, in Bohemia, abounds in various metallic ores, among which the ores of silver occasionally predominate. The prevailing rocks are gneiss and argillaceous schistus. The veins at *Catharineberg* traverse gneiss, and generally run in a north and south direction, and parallel to the mountain in which they are situated. But there are also some powerful veins which cross the mountain. One of this nature is described, which seems to be insensibly blended with the mountain rock. The vein-stone is also of the same kind of rock, but occasionally assuming the characters of a variety of granite. It is observed, that the vein, which seldom exceeds a foot in width, diminishes in thickness when the containing rocks become harder; and when the sides are found incrustated with a ferruginous clay, it appears to be richer in ores. Fissures from the sides of the vein are found to improve it: a fine white clay, with quartz

SILVER.

quartz imbedded in it, indicates rich ore; but a coarse clay, destitute of quartz, especially when it increases in quantity, and occupies the whole vein, renders it unproductive, or entirely barren. The ores of the vein now described are rich silver and copper pyrites, with fluor spar, blende, various copper-ores, and sometimes native silver and copper.

Joachimthal, a place in the same circle, has been long celebrated on account of its valuable mines. The prevailing rocks are described as grey micaceous and quartzose clay-slate, which at a great depth became more of an argillaceous nature, soft, foliated, and of a black colour. The mountains around this place have a gentle declivity towards the south, but run in lofty ridges to the east, north, and west, and are intersected by deep vallies. This inequality of surface affords great accommodation to the miners to open numerous galleries, which converge to the south, and to the valley in which stands the town of Joachimthal. All the galleries and works of this district are divided into six different fields, belonging to the same number of companies, and they are drained by two deep drifts or levels; the one of which runs in a direct line 1600 fathoms; but including its several branches, its whole length is 4500 fathoms. The depth under the highest tops of the mountain is 170 fathoms: the second great level, which runs through the space of 5600 fathoms, and in a direct line 1500 fathoms, is 20 fathoms deeper than the first; but the operations in the mines have been carried to a much greater depth; for at the time in which they were visited by Ferber, before 1774, the perpendicular depth under the surface was from 200 to 350 fathoms, and, excepting the mines in the Tyrol, were then considered as the deepest in the world.

The thickness of the veins varies from one inch to two feet; and the vein-stones are a whitish or blueish clay, argillaceous slate, and reddish horn-stone, or petro-felix, which is the matrix of the richest ores. The silver-ores which are found in this mining district are, native silver, which is attached to different vein-stones, and assumes various forms; vitreous silver-ore, which is dug out sometimes in very large masses, and is considered as a very rich ore; one hundred weight being commonly valued at 180 marks of silver: red silver-ore, sometimes beautifully crystallized and transparent, is attached to red horn-stone or calcareous spar; and white silver-ore has sometimes but rarely appeared.

The silver-mines of *Bergsladt*, in the circle of Tabor, are in hills of a gentle declivity, and composed of grey or blueish clay-slate, in which appear figures of greenish lithomarge, or semi-indurated pot-stone. These mines were formerly rich in native silver, and other ores of that metal. A vein to the west of this place, which traversed a hard rock, contained reddish-coloured felspar, with galena, blende, and a little silver; but from the part where a vein containing white arsenical pyrites came into the hanging side, the vein produced native silver, vitreous, red, and white silver-ore. Another vein in the same place, which is from two inches to one foot in width, is observed to be richest where it is thinnest. It is chiefly enriched by an undulating black clay fillure, which appears sometimes in the hanging side, and then it produces red and white silver-ore. When crossed by veins running from east to west, it appears to be cut off and barren, till beyond the place of junction it again becomes productive in its former course.

Sweden.—The silver-mines of Salberg, in Westmania, are about 28 English miles from Upsal. The ore is an argenteriferous galena, yielding from one marc to a marc and a half of silver *per* quintal; it is in compact lime-stone, and has been worked to the depth of 150 fathoms. The average profits

amount to about 4000*l.* and one-eighth is paid to the king. Porter's Travels.

Norway.—The silver-mines of Konigsberg, in Norway, are situated in mountains of moderate height, composed of nearly vertical beds of mica-slate with garnets, and of grey quartz mixed with fine black mica, and a little lime-stone and red horn-stone. Other beds are composed of a ferruginous rock, which, in the upper part of the mine, is 33 feet thick, but in the lower not more than 6 feet thick.

The veins are from half an inch to two feet or more in thickness, and cut the strata transversely. The matrix of the ore is granular lime-stone, sometimes intermixed with fluor spar. Enormous masses of native silver have sometimes been found in this mine; one is mentioned as weighing 220*lbs.* The common ores are native silver and vitreous silver. The veins are most productive in the ferruginous rock. The annual produce is about 5000*lbs.* weight of silver.

Asia.—The silver-mines of Zmeof are situated in that part of the Altaian chain of mountains which lies between the Oby and Irtysh, from 50° to 52° north latitude. The annual produce has been stated at 60,000 marcs of silver, which is alloyed with about 3 *per cent.* of gold. The mines of Nertschink in Daouria, near the river Amur, yield argenteriferous galena, producing about 30,000 marcs of silver, and containing 1½ *per cent.* of gold. The Russian merchants who trade to China bring back ingots of silver, from several ounces to a pound weight, in exchange for their commodities; hence it may be inferred, says Patrin, that there are silver-mines on the frontiers of China. Patrin, Hist. des Mines.

America.—The most productive silver-mines in the world are those of South America and New Spain. Those of Peru, for many years after its conquest by the Spaniards, yielded the greatest quantity of silver; but at present the mines of Mexico are the richest. The mines of America furnish both silver and gold; and in making an estimate of their richness, we must take an account of each of these metals. The following table, given by M. Humboldt, will shew the distribution of these mineral treasures in the different parts of the new world; the kilogramme being 2 *lbs.* 3 *oz.* 5 *dr.* avoirdupois, or rather more than 2 *lbs.* 8 *oz.* troy.

	Gold.	Silver.
Viceroyalty of Peru	782	140,478
Viceroyalty of New Spain	1,609	537,512
Capitania of Chili	2,807	6,827
Viceroyalty of Buenos Ayres	506	110,764
Viceroyalty of Grenada	4,714	
Viceroyalty of Brasil	6,873	
Kilogrammes	17,291	995,581

The above was the annual produce of the different districts, at the beginning of the 19th century; from which it appears, that the total weight of the precious metals from all the mines in America, reduced to English pounds troy, is 45,580 *lbs.* of gold, and the enormous quantity of 145,000 *lbs.* of silver; equal in weight to one-third of the tin produced by the mines in Europe. Dr. Adam Smith, in his "Wealth of Nations," values the gold and silver annually exported into Cadiz and Lisbon at only six millions sterling, including not only the registered gold and silver, but that which may be supposed to be smuggled. This estimate is only two-fifths of the real annual amount.

The mountain of Potofi has furnished, since its discovery in 1545, a mass of silver equal in value to 234,093,840*l.* sterling.

SILVER.

sterling. The mountain is 18 miles in circumference: it is composed of slate, but has a conical covering of porphyry, which gives it the form of a sugar-loaf, or basaltic hill; it rises 697 toises, or 480 yards, above the surrounding plain. The richness of the veins has diminished, as they have been worked to greater depths. At the surface of the earth, the veins of Rica, Centeno, and Mendieta, which traverse primitive slate, were filled with native silver, and silver-ores throughout their whole extent. These metallic masses rose in ridges or crests above the surface, the sides of the vein having been destroyed either by water or by some other cause. In 1545, minerals containing from 80 to 90 marcs of silver *per* quintal were common. In the year 1574, according to Acofta, the average richness of the ore was eight or nine marcs *per* quintal. In 1607, the mean wealth of the ores was not more than an ounce and a half to the quintal. The ores are now extremely poor, and it is on account of their abundance alone that the works are still in a flourishing state: for from 1574 to the year 1789, the mean quantity of silver in the ores has diminished in the proportion of 170 to 1; while the absolute quantity of silver extracted from the mines of Potosi has only diminished in the proportion of 4 to 1.

About six miles from Pafco is the mountain Jauvichora: it is distinguished by the name of the Silver mountain. It is about half a mile in diameter, and only about 30 yards in depth: it is composed of brown iron-stone, which is interspersed with pure silver. This stone does not yield more than nine marcs of silver in 500 lbs.; but there is a friable white clay met with in the middle of this mass of ore, which yields from 200 to 1000 marcs of silver in every 50 cwt. The mountain is penetrated in all directions, without any attention to security; so that it is expected it may fall in, in the course of a few years. According to Helms, this mountain yields annually 200,000 marcs of silver.

The veins of silver at Potosi are in slate, which Humboldt considers as primitive: this slate is covered with a clay porphyry, containing garnets. The mines of Gualgayoc, in Peru, are in the Alpine lime-stone. The veins which furnish nearly all the silver exported from Vera Cruz are in slate, porphyry, grauwacke, and Alpine lime-stone: the principal of these veins are those of Guanaxto, Zacatecas, and Catoree. The vein of Guanaxto yields more than one-fourth of the silver of Mexico, and a sixth part of the total produce of America. This vein is, in some parts, from 147 to 150 feet in width, including the branches, and has been wrought from Santa Isabella and San Bruno to Buena-Vista, a length of 42,000 feet. The most celebrated mines in Mexico are elevated from 6000 to 9000 feet above the level of the sea. In the Andes, the mines of Potosi, Ocuero, Pas, Pafco, and Gualgayoc, are in regions higher than the loftiest summits of the Pyrenées. A mass of rich silver-ore has been discovered near the small town of Micuicampa, at the absolute height of 13,450 feet. The great elevation of the Mexican mines is peculiarly advantageous to the working of them, as the climate is temperate, and favourable to vegetation and cultivation.

The part of the Mexican mountains which at present contains the greatest quantity of silver, lies between the twenty-first and twenty-fourth degrees of latitude; and it is not a little remarkable, that the metallic wealth of Peru should be placed at an almost equal latitude, on the other side of the equator. In the vast extent which separates the mines of La Pas and Potosi from those of Mexico, there are no others which throw into circulation a great mass of the precious metals, but those of Pafco and Chota. The

isthmus of Panama and the mountains of Guatemala contain, for a length of 600 leagues, vast tracts of ground, in which no vein has hitherto been worked with success.

The province of Quito, and the eastern part of the kingdom of New Granada, from the eighth degree of south latitude to the seventh degree of north, are equally poor in metallic wealth. It would not, however, says Humboldt, be correct to infer that these countries, which have been convulsed and torn by volcanoes, are destitute of the precious metals. Numerous metallic repositories may be concealed by beds of basalt, and other rocks of supposed volcanic origin. It should, however, be remarked, that some of the rocks, which Humboldt enumerates as very metalliferous, are by other geologists considered of volcanic origin, particularly clink-stone-porphry, and other porphyries containing hornblende, but distinguished by the absence of quartz and common felspar.

The mines of Huantajaya are celebrated for the great quantities of native silver they formerly produced. They are situated in an arid desert, and surrounded by rock-salt, near the shores of the Pacific ocean, at no great distance from the small port of Yquique, in the audience of Lima. These mines are a remarkable exception to the great elevation of silver-mines in Spanish America, being placed on a low and gentle declivity. Their produce is native silver, vitreous silver, and horn silver; the annual amount is about 50,000 lbs. troy of silver, or 80,000 marcs.

The silver-mining operations of Chili, according to Humboldt, are in general not productive; but the vein at Uspalata contains *pacos* so rich, that the produce is from 2000 to 3000 marks in every 5000 lbs., or from 40 to 60 marcs *per* quintal. Molina, in his History of Chili, describes the vein at Uspalata, on the Andes, as being nine feet in thickness. It has been traced 90 miles, and is supposed to extend 300 miles. From the main vein there are branches on each side, which extend to the neighbouring mountains: some of these branches are 30 miles in length. This is the largest metallic vein which is at present known in the world.

According to Humboldt, the greatest part of the silver extracted from the bowels of the earth in Peru is furnished by a species of ore called the *pacos*, of an earthy appearance, which M. Klaproth analysed, and was found to consist of almost imperceptible particles of native silver with the brown oxyd of iron. In Mexico, on the contrary, the greatest quantity of silver annually brought into circulation is derived from vitreous silver-ore, grey silver-ore, horn-ore, and black and red silver-ores. Native silver is not extracted in sufficient quantity to form any considerable proportion of the total produce of the mines of New Spain. It is, says this traveller, a very common prejudice in Europe, that great masses of native silver are very common in the mines of Mexico and Peru, and that in general the mines of mineralized silver, destined to amalgamation, or to smelting, contain more ounces, or marcs of silver, to the quintal, than the silver-ores of Saxony or Hungary; but he adds, I was surprised to find that the number of poor mines greatly exceeds those of the mines which, in Europe, would be esteemed rich. It is at first difficult to conceive how the famous mine of Valenciana, in Mexico, can regularly supply 30,000 marcs of silver *per* month, as the vein consists of sulphuretted silver, disseminated in almost imperceptible particles through the matrix. In the formation of these veins, it should appear that the distribution of silver has been very unequal, being sometimes concentrated at one point, and at other times disseminated in the vein through the matrix or *gangue*; for, in the midst of the poorest ores

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SILVER.

are found considerable masses of native silver. Although the new continent has not hitherto produced single masses of native silver equal to what have been found in the old, the metal is more abundant in a state of perfect purity in Mexico and Peru than in any other quarter of the globe, not in masses, but in particles disseminated through the enormous quantity of the ore called *pacos*. The result of a general investigation of the richness of different mines is, that the mean richness of the different ores is not more than from three to four ounces of silver in every sixteen hundred pounds of ore. According to this result, the ore contains, on the average, two ounces and two-fifths *per* quintal. It had formerly been asserted, that no ores were worked in Mexico that did not contain one-third part of silver. The silver-ores of Peru are not richer on the average than those of Mexico. The district of Guanaxto has before been mentioned as furnishing more than one-fourth of the silver annually extracted in America, the riches of the mines here being superior to the celebrated repository at Potosi: they are all worked in one extensive vein. Among these mines, that of the count Valenciana is one of the richest: the average produce of silver is four ounces of silver from a quintal of ore.

The whole weight of silver from the vein of Guanaxto, on an annual average from 1786 to the year 1803, has been 556,000 marcs, or 364,911 lbs. troy; and in thirty-eight years the weight of gold and silver, from the same vein, has been 12,700,000 pounds troy. In average years it yields from 500,000 to 600,000 marcs of silver, and from 1500 to 1600 marcs of gold. It has been doubted by some persons whether this be really a vein, or a metallic bed, as in some parts of its course it is parallel between the beds, or strata of the rock. It passes through both slate and porphyry, and is metalliferous in both. Though it has been before stated that the extent of this vein is more than 42,000 feet; yet the enormous mass of silver which it has supplied for the last hundred years, sufficient alone to change the price of commodities in Europe, has been extracted from an extent of less than 2000 feet; for where this vein is not widened by branches, its general width may be stated at from 38 to 48 feet. It is for the most part separated into three masses, divided by banks of mineral matter, or by part of the matrix destitute of ore.

At Valenciana the vein continues undivided to the depth of 557 feet, and then divides into three branches; and its width, from the floor to the roof, is from 164 to 196 feet. Of these three branches of the vein, there is in general only one which is rich in metals. Sometimes, when these three branches unite, the mine is uncommonly rich. In this celebrated vein there is a certain middle region, which may be considered as a repository of greater riches, for above and below this region the ores are poor in silver.

At Valenciana the rich minerals have been in the greatest abundance, 300 and 1100 feet below the mouth of the gallery.

The labour of the miner is entirely free throughout the whole kingdom of Spain, and no Indian or *Mestizoe* can be fined to work in the mines. The Mexican miner gains from 1*l.* to 1*l.* 4*s.* sterling *per* week of six days. The men employed in agriculture do not gain more than a third of that sum. The miners work nearly naked, and are searched in the most indelicate manner on leaving the mine. They frequently conceal fragments of native silver and silver-ores in their hair, under their arm-pits, in their mouths, and even in the anus, into which they force cylinders of clay containing the metal. These cylinders are called *longanas*. A register is kept of the silver found in different parts of the

body. In the mine of Valenciana, the value of these stolen minerals, a great part included in the *longanas*, amounted, from the year 1774 to 1787, to 30,000*l.* sterling.

The silver is extracted from its ores in New Spain by amalgamation with mercury, and by smelting: the proportion of silver extracted by mercury is $3\frac{1}{2}$ to 1 of that extracted by smelting; and as fuel is becoming scarce, the quantity of silver extracted by amalgamation increases, the smelting being very imperfectly conducted.

The Mexican miners do not appear to follow any fixed principle in the selection of minerals destined to smelting or amalgamation; for in one district they smelt the same ores, which in another they believe can only be managed with mercury; and it is frequently the abundance or scarcity of mercury which determines the miner in the choice of his method. In general they smelt the argentiferous galena, and the mixed minerals of blende and vitreous copper. The *pacos*, the vitreous, red, and corneous silver-ores, the grey copper-ore rich in silver, and the meagre ores, disseminated in small quantities in the matrix, they find it more profitable to amalgamate.

All the metallic wealth of the Spanish colonies is in the hands of individuals. The government possesses no other mine than that of Huanca Velica in Peru, which has been long abandoned. The individual receives from the king a grant of a certain number of *measures*, on the direction of a vein or bed; and they are only held to pay very moderate duties on the minerals extracted. These duties have been valued on the average throughout all Spanish America at $11\frac{1}{2}$ *per cent.* of the silver, and three *per cent.* for the gold. In the space of a hundred years, the annual produce of the Mexican mines has increased from twenty-five to one hundred and ten millions of francs. The produce of the mines in Peru has of late years been rather decreasing, which Humboldt attributes to its being worse governed than Mexico. The process of extraction seems also to be conducted upon worse principles than in New Spain, though in neither of these districts is smelting, or amalgamation, performed with much skill; for, according to M. Humboldt, the quantity of mercury annually consumed in New Spain exceeds two million one hundred thousand pounds troy. The mercury is separated from the amalgam by distillation; but in the whole process, the Mexicans waste eight times more than would be necessary, were the process conducted in the same manner as at Freyberg.

The following table will shew the annual produce of gold and silver in the mines of Europe, northern Asia, and America, as given by M. Humboldt, in kilogrammes. It may be regarded rather as an approximation to the real amount, than as a very accurate statement, the amount of English silver not being included; perhaps this may be estimated at 4000 lbs. troy.

		Gold.	Silver.
Europe	-	1,297	52,670
Northern Asia	-	538	21,709
America	-	17,291	795,581

The kilogramme, it has been before stated, is rather more than 2 lb. 8 oz. troy. It is impossible to value the quantity of gold and silver annually extracted on the whole globe; for we are unacquainted with the amount of what is procured in the interior of Africa, and the central parts of Asia, Tonquin, China, and Japan. The quantity of gold and silver formerly brought by the Dutch from the latter country proves that it is rich in the precious metals. We may draw the same conclusion respecting the northern frontiers of China and other parts of Asia; and the quantity of gold-

SILVER.

gold-dust brought to the western coast of Africa, leads us to believe, that the countries fouth of the Niger contain large quantities of this metal, though we have little information respecting the silver of the African continent.

Affay and Analysis of Silver-Ores.—Pure native silver requires no other affay than fusion, with a little potash to free it from its earthy matter. In the humid way the silver may be dissolved in nitric acid, and precipitated by common salt. The precipitate may then be fused with soda in a crucible, by which the silver is obtained pure, and the muriate of soda sublimed. The auriferous silver-ores may be treated with potash, by fusion in a crucible: the alloy of silver and gold is first obtained, and the two metals may be separated by the process of parting. See REFINING and ASSAYING.

Those ores which consist of silver combined with antimony or arsenic, or both, are first roasted, to drive off the arsenic and antimony, the silver remaining pure. The process is much facilitated by the use of nitre, for the purpose of oxydating the metals to be dissipated.

The humid analysis of this ore requires more particular treatment.

The ore commonly called arsenical is first to be coarsely powdered, and then distilled vinegar poured upon it, to dissolve the lime of the calcareous spar adhering to it.

A given quantity of the ore so washed is now to be finely powdered, and nitric acid poured upon it: this oxydates the metals, dissolving the greatest part, and leaving a yellowish residuum. To the part dissolved muriate of soda is to be added, which precipitates the silver. This precipitate being washed and dried, will give 77 per cent. of pure silver. To the liquid from which the last was precipitated add a solution of potash; a lightish red precipitate is now formed, which, on drying, becomes of a deep brown, and by ignition assumes the form of powder of a whitish-grey colour: this is the arseniate of iron. This substance contains iron and arsenic, in the proportions of 50 to 43 or 44. This is shewn by treating the arseniate of iron with charcoal exposed to a red heat; the arsenic is reduced, and sublimes, while the black oxyd of iron remains.

The yellowish residuum left in the first solution is to be digested with muriatic acid: if a white powder remains undissolved, it will be found to be muriate of silver, and must be added to that first obtained. To the muriatic solution add a solution of carbonate of potash, and a yellowish-green precipitate is formed: to this precipitate, when washed and dried, add muriatic acid by a little at once, till the powder is dissolved; add a large quantity of water to this solution, which will produce a white precipitate; this being separated and dried will be pure oxyd of antimony, affording $\frac{1}{2}$ of pure antimony. What remains in solution, after the last substance is separated by the water, may be precipitated by pure potash, and will be found to be oxyd of iron; which, when treated with charcoal, like the first obtained, may be added to the same to make the whole of the iron afforded by the mineral. In this way the arsenical silver-ore afforded, according to Klaproth, the following analysis:

Silver	-	-	12.75
Iron	-	-	44.25
Arsenic	-	-	35
Antimony	-	-	4
			<hr/>
			96

The sulphuretted ores in the large way sometimes merely require to be roasted to drive off the sulphur: the heat being

urged affords a button of pure silver. This is the case with the variety called *Silver-glance*.

The brittle silver-ore contains a very small portion of antimony and copper. The metallic button obtained by heat will require to be cupelled with lead, in order to get the silver pure; it may, however, be made tolerably pure by treating the button with nitre, by which the base metals are separated.

To effect the humid analysis of brittle silver-ore, the powder is dissolved in dilute nitric acid with a gentle heat. By this treatment a residuum is left equal to $\frac{2}{100}$ of the whole. The solution is to be treated with muriate of soda, like the last.

If the presence of an alkaline sulphate does not form any precipitate with the remaining solution, the mineral does not contain lead: add to the solution an excess of ammonia, and a greyish-white precipitate will be left, which is the oxyd of iron, often containing a little arsenic. If copper be present, ammonia will give to the remaining solution a fine blue colour, and that metal may be separated by a rod of clean iron.

It now remains to examine the first residuum which was unaffected by the nitric acid; this is to be digested with nitro-muriatic acid: the residuum left after this treatment will be found to be pure sulphur. The nitro-muriatic solution is now to be diluted with a large quantity of water; a white precipitate falls down, which, when washed, dried, and ignited, will be found to be oxyd of antimony, of a brown colour.

Klaproth found 100 grains of this ore to yield as follows:

Silver	-	-	-	-	66.5
Antimony	-	-	-	-	10
Iron	-	-	-	-	5
Sulphur	-	-	-	-	12
Copper and arsenic	-	-	-	-	.5
Extraneous matter from the mine	-	-	-	-	1
					<hr/>
					95

The white silver-ores afford nearly the same ingredients with the last; and the mode of analysis will be similar in the dry way.

The *light-white* and *dark-white* silver-ores contain lead and alumine, and require a different treatment. After the silver is precipitated by common salt, a quantity of muriate of lead is formed at the time, which, on concentration, affords the muriate of lead in bright silky crystals. When these are collected till the liquid will afford no more, a solution of sulphate of soda is to be added, which precipitates the remainder of the lead in the state of sulphate of lead. This powder, being washed and dried, contains $\frac{1}{3}$ ths its weight of metallic lead. The remaining liquid being super-saturated with ammonia, as in the analysis of the brittle silver-ore, a light-brown precipitate is formed: this precipitate is oxyd of iron and alumine. To separate the latter, dissolve the precipitate in nitric acid: separate the iron by prussiat of potash, or prussiat of lime, and afterwards the alumine with soda. The prussiat of iron, heated to a red heat, is decomposed, leaving the black oxyd of iron, which contains $\frac{5}{8}$ of metallic iron.

The first residuum left by the nitric acid, besides antimony and sulphur, which constituted the residuum of the brittle silver-ore, also contains lead. By the frequent addition of muriatic acid with the application of heat, the lead is separated in crystals of muriate of lead; obtaining, by this means, a solution of the muriates of lead and antimony.

SILVER.

mony. The residuum is sulphur. The muriatic solution deposits crystals of muriate of lead on cooling. When no more crystals fall down, these crystals are to be added to those obtained before. These, being heated in an assay crucible with twice their weight of black flux, afford metallic lead. This lead, however, treated in the usual way on the cupel, affords a small portion of silver. The solution still contains a small portion of muriate of lead and the antimony. By adding a solution of Glauber's salt, the lead is precipitated in the state of sulphate, affording $\frac{2}{7}$ ths its weight of metallic lead. The antimony, which is the last, may be precipitated by affusion of water. The precipitate, being washed, dried, and ignited, is the pure oxyd of antimony, yielding on its reduction $\frac{3}{7}$ of the metal. The analysis of the light white silver-ore, by Klaproth, gives of

Silver	-	-	-	-	20.4
Lead	-	-	-	-	48.06
Antimony	-	-	-	-	7.88
Iron	-	-	-	-	2.25
Sulphur	-	-	-	-	12.25
Alumine	-	-	-	-	7
Silex	-	-	-	-	0.25
					98.09

The dark silver-ore, by the same, is

Silver	-	-	-	-	9.25
Lead	-	-	-	-	41
Antimony	-	-	-	-	21.5
Iron	-	-	-	-	1.75
Sulphur	-	-	-	-	22
Alumine	-	-	-	-	1
Silex	-	-	-	-	.75
					97.25

The corneous silver-ore, which is muriate of silver, is easily reduced in the dry way by fusing it with soda, in a crucible capable of fusing the metallic silver. The soda takes the muriatic acid, forming muriate of soda, which escapes in white fumes, and the silver is left pure.

In the humid way, it is first fused in a glass retort with carbonate of potash. The mass is then dissolved in hot water, and the solution filtered. The residuum is then dissolved in nitric acid, leaving behind a red powder. This powder, being treated with nitromuriatic acid, leaves behind a small portion of muriate of silver, which must be accounted for in metallic silver, as before directed. Ammonia, being added to the nitromuriatic solution, precipitates a red powder, which is oxyd of iron. To the nitric solution, from the mass first treated with carbonate of potash, muriate of soda is now to be added; which precipitates the silver in the form of muriate, from which the metallic silver may be either calculated, or obtained by fusion with soda. The aqueous solution from the fused mass is now to be saturated with acetic acid. If alumine be present, it will be precipitated. The liquid part is now to be evaporated to dryness. If alcohol be added to the dry mass, it dissolves the acetate of potash. The residuum is then dissolved in water. To this, muriate of barytes is to be added, which, if sulphuric acid be present, will cause a precipitation of sulphate of barytes, the sulphuric acid of which is to be considered as a product of the ore, and will be equal to one-third of the weight of this precipitate, when washed and dried. The remainder of the saline mass

VOL. XXXII.

which was dissolved in water may be considered as muriate of potash, the acid of which is another ingredient of the analysis, and will be equal to $\frac{1}{3}$ of the salt.

Physical and Chemical Properties of Silver.—Silver, when pure and newly polished, is of a splendid white colour, and becomes more white when the polish is deadened. Its hardness is nearly that of copper. Its malleability is nearly equal to that of gold. At a heat visibly red in the dark, it can be worked with great facility by the hammer into various articles, in the manner of working iron. After being rolled into very thin sheets, it can be beaten into leaves of $\frac{1}{100000}$ th of an inch in thickness, and can be drawn into wire finer than a human hair. A wire of $\frac{1}{17}$ th of an inch will require 336lbs. to break it, when exerted in the direction of its length. At a temperature short of redness, these pieces can be united either by the hammer, or by pressing them together with friction by a steel burnisher.

It melts at the temperature of 28° of Wedgewood, or 4717° of Fahrenheit. If the heat be raised the metal becomes more liquid, and boils. This is occasioned by its assuming the elastic form, in which state it rises, and is condensable on the surface of bodies held over it, as has been observed with gold.

In purifying silver on the cupel, it is observed, that when it is removed from the furnace, and just at the point of congelation, a small explosion ensues, giving to the surface of the button an appearance as if some elastic fluid had been disengaged from it. It has been discovered by Mr. Samuel Lucas, of Sheffield, that the elastic fluid which is separated, producing the phenomenon in question, is pure oxygen gas.

By keeping silver long in a state of fusion, at a very high temperature, it becomes oxydated.

Macquer converted silver into a vitreous oxyd by exposing it to the heat of a porcelain furnace.

Silver is readily inflamed by electricity, and converted into an oxyd of a greenish-yellow colour.

The most direct way to obtain the oxyd of silver is by dissolving the silver in nitric acid, and precipitating it with lime-water. The precipitate is at first white, in which state it may be considered a hydrate of the oxyd. When heated, the water escapes, and it assumes a greenish-yellow colour, inclining to grey. If the heat be raised, the air being excluded, the oxygen is drawn off, leaving the metal in a state of purity: 100 parts of silver have been found to contain 7.5 of oxygen; hence, if the atom of hydrogen be 1, that of silver will be 100. No combination of silver with azote or carbon has as yet been discovered.

It combines with sulphur with great facility: the mere contact of the metal with flour of sulphur is sufficient to give the surface a yellow colour. If the silver be in thin plates, and stratified in a crucible with the same, at a red heat the combination soon takes place, and the mass fuses, forming a sulphuret of silver of a violet colour, sometimes in crystals of the shape of a needle.

This substance is brittle, but sufficiently soft to be cut with a knife. It is decomposable by heat. The sulphur escapes, leaving the metal in a state of purity. This compound is an atom of silver equal to 100, united to an atom of sulphur 15.

Sulphuret of silver is also formed by exposing the metal to sulphuretted hydrogen gas. The small quantity of the latter existing in the atmosphere is capable of soon communicating a yellow, and ultimately a purple colour to polished silver.

SILVER.

Mr. Proust found this tarnishing matter to be a sulphuret of silver. The thinnest coat of gum, or of varnish, completely defends the surface of silver from tarnishing.

Silver combines with phosphorus, forming a phosphuret of silver. This combination is effected by heating in a crucible equal parts of silver and phosphoric glass, with one-fourth their weight of charcoal powder, or, what is better, saw-dust. This compound is of a white colour. It is brittle, but may be cut with a knife. It is, like the sulphuret, decomposable by heat.

Silver combines with several metals, forming alloys. The alloy of silver with gold, when the former is in a very small quantity, is of a much paler colour than gold. These, like all other compounds, are doubtless definite, and hence we should expect, that when these metals combine in the ratio of the weights of their atoms, which will be 100 silver to 140 of gold, the alloy would be the most perfect. And the next perfect would be two atoms of one to one of the other. It is stated by Muschenbroeck, that the hardest alloy of these two metals is with two parts of gold to one of silver.

Silver, as well as rendering gold much paler, gives it a greenish tinge. This alloy is more fusible than gold, and hence is employed as a solder for that metal.

Silver does not form any striking alloy with platinum. Indeed it rather appears to be a mixture than a combination. As is the case with lead and zinc, the two metals separate, when kept some time in a state of fusion. This fact is corroborated by the circumstance, that silver can scarcely be made to unite two pieces of platinum together, when used as a solder, while gold can be employed for that purpose with the greatest success. For the other alloys of silver, see the respective metals.

Salts of Silver.—These consist of the oxyd of silver combined with an acid, some of which only are soluble in water. The presence of the soluble salts of silver is easily detected by muriatic acid, or any soluble saline compound with that acid, by occasioning a dense white precipitate, which soon changes to a purple colour when exposed to the sun's light.

The insoluble salts of silver have the property of coating bright copper with silver, when rubbed upon it with a little moisture. Salts of mercury would give the same white appearance, but this would be distinguished from silver by being capable of dissipation by heat. Salts of silver become black with the hydro-sulphurets of the alkalies. And gallic acid gives a brown precipitate.

Sulphate of Silver.—Sulphuric acid has no action upon silver at the common temperature. When, however, this metal is boiled with the acid, the silver becomes oxydated, sulphurous acid gas is disengaged, and sulphate of silver is formed, which is a white mass, sparingly soluble in water, except an excess of sulphuric acid be present. The latter, on evaporation, affords crystals of a brilliant silvery whiteness, in the form of needles or fine prisms.

This salt is soluble in nitric acid.

When heated, it first fuses, and if the heat be raised, it is decomposed, sulphuric acid and oxygen escaping, leaving the silver in its metallic form.

This salt is decomposed by the alkalies and earths, and all those soluble salts, the acids of which form insoluble compounds with silver. Bergman has stated, that 100 parts of metallic silver, precipitated from nitric acid by sulphuric acid, give 134 of the sulphate. Allowing the 100 of silver to have taken 7 of oxygen, there will remain 28 for the sulphuric acid. This, in 100, will give sulphuric acid 22,

and 78 of oxyd of silver. If this salt be composed of one atom each of acid and base, then, by Dr. Wollaston's scale, the proportions would be 25.5 acid, and 74.5 oxyd of silver. Dalton's numbers would give very nearly the same result.

Sulphate of Silver.—This salt, like the last, is sparingly soluble in water. In other respects, it is but little known.

Nitrate of Silver.—The nitric acid acts with considerable violence on silver, affording red suffocating fumes, occasioned by the copious disengagement of nitric oxyd. If the acid and the silver be pure, the solution becomes clear and colourless, without residuum: if the acid contains muriatic acid, which is often the case with the acid of the shops, then a dense white powder will fall down, which becomes purple in the sun-shine, and is the muriate of silver: if the silver contains gold, a purple powder will be left at the bottom of the vessel: if it contains copper, the solution will be of a green colour, of greater or less intensity, depending upon the quantity of that metal.

The solution of silver affords crystals on evaporation: they are of a prismatic form, but differ in their number of sides; they do not change by exposure to the air, but are very soluble in water. These crystals, when heated, first melt; the heat being raised, the water of crystallization escapes, but the mass still remains liquid: in this state it is frequently cast into moulds, in which it assumes a solid form on cooling. These sticks, which are employed in surgery under the name of *lunar caustic*, are of a grey colour, and when broken exhibit a crystalline appearance.

A more violent heat than that required for its fusion decomposes it, nitrous gas and oxygen being disengaged.

This decomposition is much more rapid when it is heated in contact with inflammable matter. If thrown upon burning coals, it detonates.

If silk, cotton, leather, ivory, and many other bodies, be moistened with nitrate of silver, and the part be afterwards moistened, when a stream of hydrogen gas is applied to it the silver becomes reduced, and appears with its metallic lustre. A stick of phosphorus dipped in nitrate of silver soon becomes coated with metallic silver.

This salt has the property of detonating with sulphur or phosphorus, by being struck smartly with a hammer.

Nitrate of silver is decomposed by all the earths which form salts, and by the alkalies, by combining with the acid. Ammonia, however, does not only precipitate the oxyd, but afterwards combines with it, forming a compound having alarming fulminating properties. The following is the process recommended for its preparation.

From the nitrate of silver precipitate the oxyd by means of lime-water: separate the oxyd, and dry it upon blotting-paper: upon this oxyd pour pure caustic ammonia: let this remain for twelve hours. If a pellicle be formed upon the surface, add a little more ammonia, which will take it up. A black precipitate will be found at the bottom of the vessel, which is the ammoniate of silver, and is the fulminating substance to be obtained. This precipitate is to be carefully collected, and laid in very small quantities upon separate bits of blotting-paper, to dry. When dry, the slightest touch or rubbing motion causes a violent explosion. Those unaccustomed to it should begin with the smallest possible quantities, as serious accidents have happened by exploding it in too large quantities. The liquid part from which the substance was separated will be found to be a solution of the same: if it be heated in a glass retort, a portion of it is decomposed, and the gaseous products disengaged: in a little time, small brilliant crystals of the same substance appear: these

SILVER.

these frequently detonate with such violence, as to break the vessel in which they are contained.

The theory of these appearances is obvious: the oxygen of the silver combines with the hydrogen of the ammonia, forming water, which, with the azotic gas of the same, are in an instant rendered so highly elastic by the caloric set free, as to produce the explosive effect so conspicuous in this substance. It is needless to say that the silver is left in the metallic form.

Nitrate of silver is decomposed by all those metals having a superior attraction for oxygen. The oxygen of the silver is given to the decomposing metal, which also combines with the acid. Copper, so employed, precipitates the silver in a white metallic powder, the result being nitrate of copper in the place of nitrate of silver. The precipitate is not pure silver, some copper will always be detected when the precipitate is re-dissolved.

Mercury has also the property of precipitating silver from the nitrate, producing the appearance which has been termed the *arbor Diana*. Lemery recommends one part of silver to be dissolved in nitric acid, and the solution to be then diluted with twenty parts of distilled water: to this add two parts of mercury. The mercury gradually occupies the place of the silver, and the latter is precipitated in the form of vegetation, from which the name has been derived.

The vegetative appearance is caused by the growth of the crystals being from the extreme points of that already formed, as is the case with the growth of vegetables. The mercury, and the smallest portion of precipitated silver, form a Galvanic combination. The silver now in solution is reduced upon that already formed, in consequence of its state of electricity being negative, that of the mercury being relatively positive, by which it attracts the acid. This process would doubtless be facilitated by dropping a small bit of metallic silver upon the mercury, added to nitrate of silver. This would form a Galvanic combination, and the bit of silver would become an immediate rallying point for the silver in solution. If a little of a dilute solution of nitrate of silver be spread upon a pane of glass laid in an horizontal position, and a common pin be laid in the middle of the covered part, in a few hours, beautiful ramifications of silver extend from every side of the pin; sometimes to the distance of an inch. This is also to be explained by Galvanism.

Muriate of Silver.—When muriatic acid, or any soluble muriate, is added to nitrate of silver, a dense and blueish-white precipitate is thrown down, which is muriate of silver. Although white when it is just precipitated, it soon assumes a purple tint by exposure to the light, and the change is quicker as the light is more intense: hence this substance has been employed to measure the degree of intensity of light, by the time in which the change of colour takes place.

It may be said to be insoluble in water: this property, and its conspicuous appearance in other respects, renders the nitrate or sulphate of silver so valuable as a test for muriatic acid. The latter, on combining with the silver, forms the salt in question.

When this salt is exposed to heat, it easily melts: on cooling, it becomes solid. It is a semi-transparent mass, of a grey colour, and of a horny appearance, from which it has been called *luna cornea*, or horn-silver. If fused with a great heat in a crucible, it becomes so thin a fluid as to sink through the pores of the crucible. It is not decomposed by any of the acids nor the alkalies, but when heated with the carbonates of potash or soda, the acid is disengaged. It dissolves in caustic ammonia, forming a transparent solution: this, by exposure to the air, undergoes considerable change. A pellicle forms on the surface, which is first of a blueish colour,

and ultimately black. This pellicle, on examination, is found to be muriate of ammonia and reduced silver. Those who with sir Humphrey Davy hold oxymuriatic acid to be a simple body under the name of chlorine, consider this substance as a compound of the latter substance with metallic silver. Sir Humphrey gives it the name of *argentane*, and Dr. Thomson, more consistently, *chloride of silver*.

The composition of this salt, according to Proust, is

Muriatic acid	-	18
Oxyd of silver	-	82
		<hr/>
		100

By the atonic theory it should be constituted by 100 + 7.5 = 107.5 of oxyd of silver, and 24 muriatic acid, which would give

Oxyd of silver	-	81.7
Muriatic acid	-	18.3
		<hr/>
		100

Sir Humphrey considers it as a compound of one proportion of chlorine, 67, and one proportion of silver, 205, which will give

Silver	-	-	75.3
Chlorine	-	-	24.7
			<hr/>
			100

Considering the 24.7 of chlorine as oxymuriatic acid, which would be 18.8 muriatic acid, and 5.9 oxygen; then giving this oxygen to 75.3 of silver, would give 81.2 of oxyd of silver, and 18.8 of muriatic acid in the 100, which nearly agrees with the above. The property which this salt has of becoming black by the action of light, has rendered it useful for marking linen. Very improper ingredients have been sold for this purpose. The nitrate of silver is employed to write with upon the linen, which is very proper; but the part is often prepared by a solution of soda or potash, instead of a solution of muriate of soda (common salt). The following will be a recipe which cannot fail of success: dissolve 30 grains of lunar caustic in one ounce of distilled water; this will be for the writing liquid. For the preparing liquor, dissolve half an ounce of common salt in four ounces of water; and in the same dissolve half an ounce of gum arabic. Moisten the part to be marked with the latter, and dry it till the writing will not run. The letters will first appear of a blueish-white, but become perfectly black by exposure to light.

The fluete, borate, phosphate, carbonate, and arseniate of silver, are insoluble powders, having no striking properties, or but little known. The arseniate is formed by adding arseniate of potash to any soluble salt of silver. It falls down in the form of powder of a yellow colour. Its insolubility, and its conspicuous colour, have been taken advantage of by employing nitrate of silver as a test for arsenic.

The chromate of silver is an insoluble salt, of a red colour; it is formed by adding chromate of potash to nitrate of silver. It, however, becomes purple by exposure to air and light.

Acetate of silver is a soluble salt, formed by adding the acetic acid to oxyd of silver. The solution affords prismatic crystals.

The rest of the salts are but little known.

SILVER, in *Medicine*, is called *luna*, the moon; and has been much extolled for its virtues by chemical writers. But

crude silver, however comminuted or attenuated, has not been observed to produce any medical effect. It is not soluble in any of the fluids of the animal or vegetable kingdom.

Several preparations have been made from silver; particularly a

SILVER Pill, or *Pilula Lunaris*, which is a chemical preparation of silver, formerly highly commended as an anthelmintic, and as a purgative remedy for dropsies, and in many other inveterate ulcerous diseases.

The method of making it is this: dissolve an ounce of pure nitre in distilled water; then dissolve an ounce of crystals of silver, made in the common way, with pure silver and aqua fortis, in three times the weight of water, so that the solution may be perfectly limpid: mix the two solutions together, they will become a clear homogeneous liquor; evaporate this to a pellicle, and crystals resembling nitre will shoot; pour off the remaining nitre as before, and the remaining nitre will shoot with the silver, in form of crystals, again, upon a second evaporation: let these crystals be dried upon a paper, and then placed in a glass vessel in a very gentle heat, enough to make them smoke, but not run; stir it with a piece of glass all the time, and keep it over the fire, till no more fumes arise; thus the acid spirits will be driven off, and the silver remain of a very bitter taste and purging quality. It must be kept in a dry close vessel.

This discovery has been made to serve to many other purposes, besides its uses in medicine, and has furnished the dishonest pretenders to alchemy with one of their most cunning methods of deceit. They have been able, by this means, to conceal silver in nitre, and that in a very large proportion, as in one-tenth part of the whole quantity; and this nitre being projected in an equal quantity on melted lead, gives an increase of one-tenth part in silver, which remaining upon the test, will deceive the ignorant, as if a tenth part of the lead were converted into pure silver. People who are upon their guard, may, however, discover the cheat, by dissolving the pretended nitre in ten times its weight of water, and putting a polished plate of copper into the solution; for every particle of the silver will then be precipitated out of the liquor upon the copper, and to the bottom of the vessel.

The medicinal use is this: the dried mass, consisting of the salts of silver and nitre, is to be reduced to a fine powder: this powder, applied to ulcers, acts in the manner of the lapis infernalis, or silver-caustic, only much milder: but for internal use, the quantity of two grains of it is to be ground to a fine powder, with six grains of loaf-sugar, in a glass mortar; this is to be then mixed with ten grains of the crumb of bread, and formed into nine pills: these are to be taken by a grown person upon an empty stomach, drinking after them four or six ounces of hot water, sweetened with honey. It purges gently, and brings away a liquid matter like water, often unperceived by the patient. It is said to kill worms, and perform great things in many obstinate ulcerous disorders. It purges without griping, but it must not be used too freely, nor in too large a dose, for it always proves weakening, and in some degree corrosive on the stomach; but this inconvenience is greatly alleviated by rob of juniper. Boerh. Chem. part ii. p. 297.

However, with this assistance, it is at best a dangerous medicine, and as such is deservedly excluded from practice. Lewis.

SILVER, Tincture of, is made by dissolving thin silver plates, or silver shot, in spirit of nitre; and pouring the solution into another vessel full of salt-water. By this means, the silver is immediately precipitated in a very white

powder, which they wash several times in spring water. This powder they put into a matras; and pour rectified spirit of wine, and volatile salt of urine, upon it. The whole is left to digest in a moderate heat for fifteen days; during which, the spirit of wine assumes a beautiful sky-blue colour, and becomes an ingredient in several medicines. This is also called *potable silver*, *argentum potabile*.

Silver is likewise converted into crystals, by means of the same spirit of nitre; and this is called *vitriol of silver*.

The lapis infernalis argenteus is nothing but the crystals of silver melted with a gentle heat in a crucible; and then poured into iron moulds. See CAUSTIC, *Lunar*.

SILVER Ale. See ALE.

SILVER Bush, in *Botany*, a species of *Anthyllis*; which see. See also BARBA *Jovis*.

SILVER Coin. See COIN, and MONEY.

SILVER Fir, the name of a tree of the pine kind. See PINE.

SILVER, Green and Herring. See the adjectives.

SILVER, Inflammable, a chemical preparation of the lapis infernalis made by a small heat. The process is this: take an ignited piece of Dutch turf, after it ceases to smoke; place it with its upper flat surface parallel to the horizon; make a little cavity in the middle, and therein put a drachm of dry lapis infernalis; it will immediately melt and glow, and finally it will take flame, and hiss and shine like nitre: after the flame ceases, pure silver will be found in the hollow, as much in quantity as was used in making so much lapis infernalis.

This curious experiment shews the physical manner in which acids do but superficially adhere to silver; and the manner in which acids operate, when united to metals, while surrounding their metallic mass, they arm the ponderous principles of them with spiculæ: it shews also the immutability of silver dissolved in an acid, and the various ways in which it may be concealed, yet still have its action: it also shews the difference of potable silver, while existing in a saline form, by means of an adhering acid, from that potable silver of the adepts, where the principles of silver are supposed converted into a fluid, that will mix with the juices of the body, and cannot be reduced to silver again; but the great thing to be here observed is, that the acid spirit of nitre, adhering in a solid mass of silver, is, in this state, as inflammable, on coming in contact with an ignited combustible body, as crude nitre itself: this seems to happen with silver alone, which is unchangeable with spirit of nitre. Hence also we see one way, by which silver may be obtained pure from other adhering matters, by bare burning: the acid here acts neither upon the mercurial part of the silver, nor on its fixing sulphur. Boerh. Chem. part ii. p. 297.

SILVER, King's. See KING'S Silver.

SILVER-Leaf is that which the gold-beaters have reduced into fine thin leaves, to be used by gilders, &c. See GOLD-Leaf.

SILVER, Quick. See MERCURY.

SILVER, Rep. See REP Silver.

SILVER, Salt. See SALT Silver.

SILVER, Shell, is made of the shreds of silver leaves, or of the leaves themselves: and used in painting and silvering certain works. It is prepared after the same manner as shell-gold. See GOLD.

SILVER, Slough. See SLOUGH Silver.

SILVER, Smoke. See SMOKE Silver.

SILVER-Tree, in *Botany*. See PROTEA.

SILVER-Weed, a species of *Potentilla*; which see.

SILVER-Weed, in *Agriculture*, a term applied to wild tansey; a plant which grows naturally upon cold stiff land

in most parts, and is a sure mark of the sterility of the soil. Its stalks spread upon the ground, and send out roots from their joints; by which means, and by frequent shedding of its seeds, as it flowers during the whole summer, it soon over-runs, and fills the land to a great distance. Its leaves are composed of several lobes or wings, which are generally placed along the mid-rib, and terminated by an odd one: they are jagged at their edges, and are of a silvery colour, especially on their under side. It has been noticed by Mr. Ray, that the root is somewhat of the tap-rooted or parsnip kind, and that hogs are very fond of feeding upon it.

SILVER, *White-hart*. See WHITE-HART Silver.

SILVER Wire, is silver drawn through the holes of a wire-drawing iron, and by this means reduced to the fineness of a thread or hair. The manner of drawing it, see under the article GOLD Wire. See also WIRE, and DRAWING.

SILVER Bluff, in *Geography*, a headland on the coast of South Carolina, at the mouth of the river Savannah.

SILVER Cayes, a cluster of rocks, 10 miles S. of Grand Cayes.

SILVER Creek, a river of America, in Kentucky, which runs into the river Kentucky, N. lat. $37^{\circ} 41'$. W. long. $84^{\circ} 40'$.

SILVER-GRAIN, in *Vegetable Physiology*, is described by Mr. Knight, Phil. Trans. for 1801, 344, as consisting of numerous thin plates, "diverging in every direction from the medulla to the bark, having little adhesion to each other at any time, and less during spring and summer, than in autumn and winter; whence the greater brittleness of wood in the former seasons." The same writer remarks, that these plates are visible in every wood which he had examined, except some of the Palm tribe; but are of a different width in different kinds, lying between, and pressing upon, the sap-vessels of the *alburnum*. It may be observed, that in the oak "every tube is touched by them at short distances, and slightly diverted from its course. If these," continues Mr. Knight, "are expandible under changes of temperature, or from any cause arising from the powers of vegetable life, I conceive that they are as well placed as is possible, to propel the sap to the extremities of the branches; and their restless temper, after the tree has ceased to live, inclines me to believe, that they are not made to be idle whilst it continues alive." In support of this opinion, we would remark, that the plates in question are found where the spiral coats of the sap-vessels either no longer exist, or have lost their elasticity. See CIRCULATION of the Sap.

SILVERING, the covering of any work with a thin coating of silver. This operation is recommended by two circumstances; viz. the superior beauty of silver to that of the cheaper metals, and also its superior wholesomeness to copper, brass, or lead, for culinary purposes, as it is not corroded by vinegar and other weak acids.

Silvering may be performed on the same substances, and by similar methods with *gilding*; which see. But as works of this kind are liable to tarnish and speckle, they are seldom used. But when this is the case, the coating of silver should be much thicker than that of gold, because otherwise the friction which is necessary for removing the tarnish, would soon wear off the silver from the most prominent parts, and expose to view the subjacent copper or brass. In order to avoid this inconvenience, some have recommended, when silvering is admitted, a strong varnish, formed of some of the compositions of mastic, sandarac, the gums animi or copal, and white rosin, to be put over it.

The varnish recommended in silvering leather may be applied to other purposes. See LACQUER.

The silver powder, called *argentum musivum*, may be either

tempered, in the manner of the shell-gold, with gum-water, or rubbed over a ground properly sized; and it will take a very good polish from the dog's tooth or burnishers; and hold its colour much better with a slight coat of varnish over it, than any true silver powder or leaf.

The sizes for silvering, when they are used for this purpose, ought not to be mixed, as in the case of gold, with yellow, or bole armoniac, but with some white substance, whose effect may prevent any small failures in covering the ground with the silver from being seen. This may be done with flake-white, or white-lead, when the sizes formed of oil are used; but whiting, or tobacco-pipe clay, with a little lamp-black added to it, is the proper matter in the burnish size for silvering, or wherever the glovers' or parchment size is used.

It is usual to silver metals, wood, paper, &c.

The only metals to which silvering is applied are copper and brass, and very rarely iron; and there are three modes of performing this operation, viz. by *amalgamation*, by *murriated silver*, and by *silver in substance*. The first mode is performed by adding plates of copper to a solution of nitrated silver, which will precipitate the silver in its metallic state, and very finely divided; scrape this from the copper, and let it be well washed and dried. With half an ounce of this powder, of common salt and sal ammoniac two ounces, and one drachm of corrosive sublimate, well rubbed together, make a paste by the addition of a little water, then clean the vessel to be silvered with a small quantity of diluted aqua fortis, or by scouring it with a mixture of common salt and tartar. Rub it, when perfectly clean, with the paste already mentioned, until it is entirely covered with a white metallic coating; which coating is an amalgam produced by the decomposition of the corrosive sublimate by means of the copper, to the surface of which it applies very closely and expeditiously. The copper thus silvered over is then to be washed, dried, and heated nearly red, for the purpose of driving off the mercury: the silver remains behind and adheres firmly to the copper, in a state capable of receiving a high polish. The second method of silvering is that by *luna cornea*. For this purpose, prepare the luna cornea in the usual manner, by pouring a solution of common salt into nitrate of silver, as long as any precipitation occurs, and boiling the mixture; then mix the white curdy matter thus obtained with three parts of good pearl-ash, one part of washed whiting, and a little more than one part of common salt. After the surface of the brass, cleared from scratches, has been rubbed with a piece of old hat and rotten stone, in order to remove any grease, and then moistened with salt and water, a little of the composition, being now rubbed on with the finger, will presently cover the surface of the metal with silver. Then wash it well, rub it dry with soft rag, and then, as the coat of silver is very thin, cover it with transparent varnish to preserve it from tarnish. As this kind of silvering is very imperfect, it is only used for the faces of clocks, the scales of barometers, or similar objects. (See LUNA CORNEA.) The third mode of performing this operation is by means of silver in substance: and of doing this there are three different methods. The first is by mixing together 20 grains of silver precipitated by copper, two drachms of tartar, two drachms of common salt, and half a drachm of alum; and rubbing this composition on a perfectly clean surface of copper or brass will cover it with a thin coating of silver, which may be polished with a piece of soft leather. Another and better method, called French plating, consists in burnishing down upon the surface of the copper successive layers of leaf-silver to any required thickness. Although the silver in this operation is more solid than

than in any of the former modes, the process is tedious, nor can the junctures of the leaves of silver be always entirely concealed. But the best method of all is the English plating, for an account of which see *PLATED MANUFACTURE*. Aikin's Dict.

Brass may be silvered, by boiling it with filings of good pewter and white tartar, in equal quantities. There are several other methods of silvering, for which see Smith's Laboratory, p. 37, seq.; also *Handmaid to the Arts*, vol. i. p. 471, &c. See *GILDING of Metals*.

The following is the recipe in practice with button-makers for covering the inferior kinds of plated buttons: 3lbs. of sulphate of zinc; 3lbs. of common salt; 1 oz. of corrosive sublimate; and 2 oz. of muriate of silver. This is made into a pulpy state with water, and the buttons smeared over with it. They are then exposed to a certain degree of heat, which first causes the surface to be covered with an amalgam of silver and mercury, and then expelling the latter, which requires nearly a red heat, the copper retains a permanent coating of silver. This is afterwards to be cleaned and burnished, by which it acquires a silvery lustre, which, for a time, appears like durable plating. The salt and the sulphate of zinc appear to be of no other use than to dilute and give a pulpy consistence to the mass.

Silvering in the cold is performed by the following composition: 3lbs. of cream of tartar; 3lbs. of common salt; and 1 oz. of muriate of silver, which is the precipitate formed by adding common salt to nitrate of silver, till no more is precipitated. This composition is made into a similar pulp. The surface of the copper or brass to be silvered must first be cleaned with diluted acid, and then made dry, and kept free from grease. The surface, being now rubbed with the above paste, will assume a white colour, by the silver adhering to it. This process is generally employed for silvering clock-faces, and the scales of instruments. The surface should always be varnished to prevent its tarnishing, as the silver is too thin to bear cleaning. See *BUTTON*.

SILVERING of Leather. See *LACQUER and Japanners' GILDING*.

The proceeding in silvering the leather is in all respects the same as when it is to have the appearance of gilding, except that, instead of the yellow varnish, a clear colourless one is to be used, where the appearance of silver is to be preserved.

The most common varnish for this purpose is only parchment size, made warm, and laid on with a sponge. However, the more hard and transparent the varnishes are, and the more they are of a resinous nature, the more brilliant and white, and the more durable, will be the silvery and polished appearance of the silvered leather. Some, instead of the parchment size, use that made of isinglass.

SILVERING of Mirrors, is the application of a coating of quicksilver to their posterior surface, in the manner briefly described under the article *LOOKING-Glasses*. The management of the silvering is, in this case, extremely simple, and is thus detailed in Aikin's Dictionary. A perfectly flat slab of free-stone (or sometimes of thick wood), a little larger than the largest plate, is inclosed in a square wooden frame or box, open at the top, and with a ledge rising a few inches on three sides, and cut down even with the stone on the fourth. A small channel or gutter is cut at the bottom of the wooden frame, serving to convey the waste mercury down into a vessel below, set to catch it. The slab is also fixed on a centre pivot, so that one end may be raised by wedges (and of course the other depressed) at pleasure, when working freely in the box.

The slab being first laid quite horizontal, and covered with grey paper stretched tight over it, a sheet of tin-foil, a little bigger than the plate to be silvered, is spread over it, and every crease smoothed down carefully; a little mercury is then laid upon it, and spread over with a tight roll of cloth, immediately after which as much mercury is poured over it as will lie on the flat surface without spilling. That part of the slab which is opposite the cut-down side of the wooden frame is then covered with parchment, and the glass plate is lifted up with care and slid in (holding it quite horizontally) over the parchment, and lodged on the surface of the slab. The particular care required here is, that the under surface of the glass should from the first just dip into the surface of the mercury (skimming it off as it were), but without touching the tin-leaf in its passage, which it might tear. By this means no bubbles of air can get between the glass and the metal, and also any little dust or oxyd floating on the mercury is swept off before the plate without interfering. The plate being then let go, sinks on the tin-foil, squeezing out the superfluous mercury, which passes into the channel of the wooden frame above-mentioned. The plate is then covered with a thick flannel, and is loaded over the whole surface with lead or iron weights, and at the same time is tilted up a little, by which still more of the mercury is squeezed out. It remains in this situation for a day, the slope of the stone slab being gradually increased to favour the dripping of the mercury. The plate is then very cautiously removed, touching it only by the edges and upper side, and the under side is found uniformly covered with a soft pasty amalgam, consisting of the tin-leaf thoroughly soaked with the quicksilver, and about the thickness of parchment. It is then set up in a wooden frame, and allowed to remain there for several days, the slope of its position being gradually increased, till the amalgam is sufficiently hardened to adhere so firmly as not to be removed by slight scratches, after which the plate is finished and fit for framing.

It is a considerable time before the amalgam has acquired its utmost degree of hardness, so that globules of mercury will often drip from new mirrors some time after they have been set up in rooms; and violent concussions of the air, such as from the firing of cannon, will often detach portions of the amalgam. These can never be perfectly replaced by any patching, as the lines of junction with the old amalgam will always be marked by white seams, seen when looking into the glass. See *FOLIATING of Looking-Glasses*.

SILVERING of Paper. See *Chinese PAPER*.

SILVERIUS, pope, in *Biography*, the son of pope Hormisdas, was placed in the pontifical chair in the year 536, upon the death of Agapetus. Belisarius, the famous general of Justinian, having soon after taken possession of Rome, the empress Theodora resolved to take this opportunity of restoring Anthemius, patriarch of Constantinople, and his party, who had been condemned for heresy by the council of Chalcedon. She wrote to Silverius, urging him to recognize Anthemius as lawful bishop, to which he gave a positive refusal. Upon this the empress made an engagement with the deacon Vigilius, that he should be raised to the popedom on condition that he would anathematize the council of Chalcedon, and re-admit Anthemius and his party; and she at the same time sent orders to Belisarius to depose Silverius. To furnish a pretext for this act, an accusation of treason was brought against the pope, as having invited the Goths to repossess themselves of Rome. This change was most probably invented for the purpose, and without the smallest foundation; and Belisarius, without acting upon it, sent for Silverius, and endeavoured by persuasion

persuasion to get him to comply with the emperor's requisition, but he remained firm. Finding, however, that he had not strength to oppose his enemies, he took sanctuary in a church; but being artfully drawn from it, he was stripped of the ensigns of dignity, and exiled in the year after he had been elected pope. When arrived at Patara, a city in Lycia, the place of his exile, the bishop of the place met him, and, indignant at the treatment he had experienced, undertook to lay the case before the emperor, then at Constantinople, and from his representation, Justinian ordered the cause to be re-heard. Silverius, immediately on receiving this order, went to Rome, where his manly conduct and personal appearance greatly disconcerted Vigilius, who had intruded into his chair. Through the intrigues, however, of Vigilius with Antonina, the wife of Belisarius, Silverius was put into his hands, and carried to the island of Palmaria, on the coast of Liguria, where he died, from want or hardship, in or about June, in the year 538; though Baronius maintains that he held a synod of four bishops in the island, at which he excommunicated Vigilius, and that he did not die till June 540. In the church of Rome he is honoured as a martyr to orthodoxy.

SILVERMINES, in *Geography*, a small town of the county of Tipperary, Ireland, which obtained its name from productive lead-mines in the neighbourhood, from which much virgin silver was formerly obtained. These mines, the property of lord Dunally, are no longer wrought, and are thought to be exhausted. Silvermines is north of the Keeper mountains, and gives name to a lower ridge of hills. It is 77 miles S.W. from Dublin, and about 5 miles S. from Nenagh.

SILVES, a town of Portugal, in the province of Algarve, situated on a river of the same name, containing 1600 inhabitants; formerly more considerable than at present, and from the year 1188 to 1580 a bishop's see, which was afterwards removed to Faro; 15 miles E.N.E. of Lagos. N. lat. $37^{\circ} 10'$. W. long. $8^{\circ} 21'$.—Also, a river of Portugal, which runs into the Atlantic, a little below Villa Nova de Portimao.

SILVESTER I., pope, in *Biography*, was elected to the see of Rome in January 314. In that year was held the council of Arles, to which Silvester was invited, but he excused himself on account of his age, and sent two presbyters and two deacons as his deputies. To the general council of Nice, in 325, he also sent deputies, which council was convened by the emperor, and not by the pope, nor did the latter preside at it. It was during this pontificate that the hierarchy of the Christian church, as it has ever since existed, formed upon the model of the civil government of the empire, took its origin. Silvester died in 335, after having held the papal see nearly twenty-one years.

SILVESTER II., pope, previously named *Gerbert*, was born of an obscure family in Auvergne, in the 10th century. At an early age he entered himself as a monk in the monastery of St. Gerard, Aurillac. After laying a foundation of all the sciences cultivated in that ignorant age, he travelled for improvement, and visited Spain, in order to hear the Arabian doctors in its universities. At length he rendered himself so distinguished, that he was appointed by Hugh Capet preceptor to his son Robert. At Rome he became known to the emperor Otho I., who placed him at the head of the abbey of Bobbio, about the year 970. Having resided there some years, he returned to France, but visited occasionally Italy. In one of those visits he met with Otho II. at Pavia, who took him to Ravenna, where he held a solemn deputation on a mathematical question with a Saxon, very eminent for his learning. He was

afterwards made preceptor to Otho III., who succeeded to the imperial crown while he was still a minor. In the year 991, Hugh Capet promoted him to the archbishopric of Rheims; but this elevation was a source of disquiet to him, and after much contention, he was obliged to resign the see to Arnulf, the natural son of Lothaire, king of France, who had been formerly deposed from it. This was in the year 997, and at the same time Otho III. conferred upon him the archbishopric of Ravenna; and on the death of pope Gregory V. in 999, he was elected to the papal dignity, when he assumed the name of Silvester. The acts of his pontificate were but few, and not at all important. In the year 1000 he is said to have conferred on Stephen I., king of Hungary, the royal title, with the famous crown, the palladium of that kingdom, and to have constituted him perpetual legate of the holy see, with power to dispose of all ecclesiastical benefices. An extraordinary instance of ecclesiastical vigour in this popedom is mentioned by Ademar, which, if it may be relied on, proves both the great power of the church at that period, and the disposition to abuse it. Guy, count of Limoges, having imprisoned Grimoald, bishop of that city, for taking possession of a disputed monastery, and afterwards released him, the bishop repaired to Rome, and complained to the pope, who cited Guy to his presence. The cause being heard, the count was condemned by the pope and senate to be bound to the tail of a wild horse, and dragged away till he was torn to pieces, the execution of which sentence he escaped by compromising the affair with the bishop, his accuser, and taking flight along with him. Silvester died in the year 1003. He was a very meritorious character, a promoter of learning, and a proficient in various branches of the sciences. He spent much time and large sums of money in the collection of books from various parts of Europe, composed himself a number of works, particularly in arithmetic and geometry, and with his own hands made globes, a clock, and an astrolabe. Living, as he did, in the very depths of the dark ages, he fell under the suspicion of magical practices, and several ridiculous stories are related to this purpose. There were, however, persons who knew how to appreciate his character: he is mentioned by Otho "as a most learned man, and eminent in the three branches of philosophy." He wrote a great number of letters on various topics, of which 160 of them were printed at Paris in 1611. One of these, written in the first year of his pontificate, is a call to the church universal, for delivering the Christians in Palestine; in other words, a project for a crusade.

SILVESTRE GRANUM, or **COCCUS SILVESTRI**, a term used by some authors to express the *coccus Polonicus*; and by others, for a coarse or bad kind of cochineal, produced in the province of Guatemala, in New Spain; it is by some supposed to be the seed of a plant, but is, in reality, an insect, as the true cochineal is, only that the scarlet colour it yields is greatly inferior to the other. See **COCHINEAL**.

SILVIUM, in *Ancient Geography*, a place of Italy, in Peucetia, E. of Venusia. The name is formed from *Silva*, a grove found in this place, and probably the "*Saltus Bantini*" mentioned by Horace.

SILUM, in *Geography*, a small island in the Adriatic. N. lat. $44^{\circ} 39'$. E. long. $14^{\circ} 50'$.

SILURES, or, according to the orthography of Ptolemy, *Sylures*, in *Ancient Geography*, a people of the isle of Albion, who possessed, besides the two English counties of Hereford and Monmouth, Radnorshire, Brecknockshire, and Glamorganshire, in South Wales. The northern part of

of Herefordshire has been supposed by some to belong to the Ordovices. The name of this ancient British nation is derived, by some of our antiquaries, from *coil*, a wood, and *ures*, men, because they inhabited a woody country; and by others, from the British words *es heuil iir*, which signify brave or fierce men. Tacitus has conjectured, with little probability, and no sufficient evidence, that the Silures had come originally from Spain, grounding the conjecture on a supposed, or perhaps fancied resemblance between them and the ancient Spaniards, in their persons and complexions. It is much more probable, that they, as well as the other ancient inhabitants of Britain, had come from some part or other of the neighbouring continent of Gaul. But from whencesoever they derived their origin, they reflected no dishonour upon it, as their posterity have not degenerated from them. The Silures were unquestionably one of the bravest of the ancient British nations, and defended their country and their liberty against the Romans with the most heroic fortitude. For though they had received a dreadful defeat from Ostorius Scapula, and had lost their renowned commander Caractacus, they still continued undaunted and implacable; and by their bold and frequent attacks, they at length broke the heart of the brave Ostorius. But all their efforts were at last in vain. They were repulsed by Aulus Didius, further weakened by Petilius Cerealis, and at last totally subdued by Julius Frontinus, in the reign of Vespasian. As the Romans had found great difficulty in subduing the Silures, so they took great pains to keep them in subjection, by building strong forts, and planting strong garrisons in their country. One of the most considerable of these fortifications, and the capital of the whole country, was Isca Silurum, now Caerleon, on the river Wisk, in Monmouthshire. Here the second legion of the Romans, which had contributed greatly to the reduction of the Silures, was placed in garrison (as some antiquaries have imagined) by Julius Frontinus, to keep that people in obedience. It is however certain, that this legion was very early, and very long stationed at this place. Isca Silurum was, in the Roman times, a city not only of great strength, but also of great beauty and magnificence. This is evident from the description which is given us of its ruins by Giraldus Cambrensis, in his topography of Wales, several ages after it had been destroyed and abandoned. "This (Caer Leion, or the city of the legion) was a very ancient city, enjoying honourable privileges, and was elegantly built by the Romans, with brick walls. Many vestiges of its ancient splendour are yet remaining; stately palaces, which formerly, with their gilded tiles, displayed the Roman grandeur. For it was first built by the Roman nobility, and adorned with sumptuous edifices; also an exceeding high tower, remarkable hot-baths, ruins of ancient temples, theatres encompassed with stately walls, partly yet standing. Subterraneous edifices are frequently met with, not only within the walls (which are about three miles in circumference) but also in the suburbs; as aqueducts, vaults, hypocausts, stoves, &c." This description of Caer-Leion was composed in the twelfth century, and therefore we have no reason to be surprised that its very ruins are now so entirely destroyed, that they are hardly discernible. On the banks of the river Wisk, besides Isca Silurum, there stood two other Roman towns; Burrium, now Usk, and Gobannium, now Abergavenny. Venta Silurum, now Caer-Gwent, near Chepstow, in Monmouthshire, was also a considerable Roman town, of which there are some faint vestiges still remaining. Blestum, in the thirteenth journey of Antoninus, is supposed to have been situated at Monmouth; and Magna, in the twelfth journey, at Kenchester, or as others think, at Ledbury, in Herefordshire. When the Roman

territories in Britain were divided into five provinces, the greatest part of the country of the Silures was in that province which was called Britannia Secunda. Henry's Hist. vol. i.

SILURUS, in *Ichthyology*, a genus of fishes of the order Abdominales, of which the generic character is as follows: The head is naked, large, broad, and compressed; the mouth is furnished with cirri, resembling the feelers of insects; the gape is very large, extending almost the whole length of the head; the lips are thick, jaws furnished with teeth; the tongue thick, smooth, and very short; the eyes are small; the gill-membrane is characterized with from four to seventeen rays; body elongated, compressed, without scales, mucous; lateral line near the back; the first ray of the dorsal or pectoral fins serrate, with reversed spines. There are twenty-eight species, divided into sections, according to the number of their cirri, as follow: the fishes in section A have *two* cirri; in section B, *four*; in section C, *six*; in section D, *eight*; and in section E, the fishes are without cirri.

The name is of Grecian origin, and is derived from the words *σειν*, to move or shake, and *ουρα*, a tail. It is given to this fish, from its remarkable quality of being almost continually moving its tail in the water.

Section A. Two Cirri.

Species.

MILITARIS. The specific character of this is, that its second dorsal fin is fleshy; cirri bony, toothed. It inhabits many rivers in Asia; feeds on smaller fishes, and grows to a large size. It is from twelve to eighteen inches long; the head and fore-parts are broad and depressed; the mouth is very wide; the teeth are small and numerous; the eyes are large; on each side the head, near the nostrils, a very strong subcrest, spine, or bony process; first ray of the dorsal fin excessively large, strong, and sharply serrated, both on the middle part and towards the tip; the tail slightly bilobate, with rounded lobes. It is a native of the Indian rivers.

INERMIS. Second dorsal fin fleshy; fins unarmed. It inhabits the rivers of Surinam. This is denominated by some naturalists the subolivaceous silurus. It is transversely banded with brown spots, with unarmed fins, and flexuous lateral lines. It is about twelve inches in length; the head is bony, but smooth, and it is destitute of spiny processes. It is a native of the Indian and South American rivers.

Section B. Four Cirri.

Species.

ASOTUS. The back of this fish has only one fin: it inhabits Asia: there are two cirri above the mouth, and two beneath; the teeth are numerous; the dorsal fin is without spinous rays; the first ray of the pectoral is serrate; the anal fin is long, and connected with the caudal.

CHILENSIS. Second dorsal fin fleshy; the tail is lanceolate: it inhabits the fresh waters of Chili: it is about ten inches long; the body is brown; beneath it is white. The flesh is said to be excellent.

BAGRE. Second dorsal fin fleshy; first ray of the dorsal and pectoral fins setaceous. It inhabits South America.

CALLICHTHYS. Second dorsal fin one-rayed; a double row of scales on the sides. It inhabits the small running streams of Europe, and when these are dried up, it crawls across meadows in search of water: it is said to perforate the sides of reservoirs, for the purpose of making its escape.

Section

SILURUS.

Section C. *Six Cirri.*

Species.

GLANIS, or European Silurus. This is also called the great or common silurus, and may be considered as the largest of all European river-fish, growing, in some cases, to the length of eight, ten, twelve, or even fifteen feet, and to the weight of 300 pounds. Its more general length, however, is from two to four feet. The head is broad and depressed; the body thick, and of a lengthened form, with the abdomen very thick and short. It is of a sluggish disposition, being rarely observed in motion, and commonly lying half imbedded in the soft bottom of the rivers which it frequents, under the projecting roots of trees, rocks, logs, or other substances. In this situation it remains, with its wide mouth half open, gently moving about the long cirri situated on each side the jaws, which the smaller fishes mistaking for worms, and attempting to seize, become a ready prey to the silurus. The colour of this species is dark olive, varied with irregular spots of black; the abdomen and lips are of a pale flesh-colour, and the fins are tinged with violet. It is an inhabitant of the larger rivers of Europe, as well as some parts of Asia and Africa, but it appears to be most plentiful in the north of Europe. It is not much esteemed as food, the flesh being of a glutinous nature; but from its cheapness, it is in much request among the inferior ranks of society, and is eaten either fresh or salted. The skin, which is smooth, and destitute of apparent scales, is dried and stretched, and after rubbing with oil, becomes of a horny transparency and strength, and is used in some of the northern regions instead of glass for windows. The silurus is not a very prolific fish, depositing a small quantity of spawn, consisting of large globules or ova; these, as well as the newly hatched young, are frequently the prey of other fishes, frogs, &c., and thus the great increase of the species is prevented. The ova are said to be hatched in about a week after their exclusion.

ELECTRICUS. The dorsal fin is single and fleshy. The head is depressed; the eyes are moderate, covered with the common skin; the teeth are crowded, small, and sharp in each jaw; the nostrils are very minute; each side approximate; upper lip bearded with two cirri, the lower with four, of which the exterior ones are longer. It inhabits the rivers of Africa. It is about twenty inches long; the body is long and broad on the fore part, depressed, pale ash-colour, with a few blackish spots towards the tail; when touched, it communicates a trifling shock, attended with a sort of trembling and pain in the limbs, but less violent than that given by the

TORPEDO, which see. The flesh of the electrical silurus is eatable.

FELIS. The second dorsal fin of the fish of this species is fleshy; it has 23 anal rays; the tail is bifid. It is found in Carolina; the body above is blueish.

GALEATUS. The second dorsal fin of this fish is fleshy; it has 24 anal rays, and the tail is entire. It inhabits South America. The head is covered with a hard coriaceous shield; the spinous rays of the pectoral and dorsal fins are rigid.

CARINATUS. Second dorsal fin fleshy; the lateral line is spinous; the cirri under the lower lip are connected. It inhabits Surinam; the body is compressed.

NILOTICUS. The second dorsal fin of this is fleshy; the anal rays are ten in number. It is found in the Nile; is fourteen inches and a half long; the body is of a brownish-grey; the sides of the head are blueish; the end of the nose, under part of the head, pectoral fins and cirri, are

tinged with red: there is a semicircle of reddish at the commencement of the tail.

CLARIAS. Second dorsal fin fleshy; anal rays eleven. It inhabits the rivers of South America and Africa; is from twelve to fifteen inches long; the body is of a blackish-ash, beneath it is hoary; it is said to inflict venomous wounds with the serrated pectoral fin.

FASCIATUS. Second dorsal fin fleshy; the anal rays are thirteen. It inhabits Surinam and the Brazils: the body is black, with white bands on each side, beneath it is white; the flesh is in high esteem; the head is depressed, rounded on the fore part; a third part as long as the whole body; the fins are all spotted with black.

ASCITA. The second dorsal fin fleshy; it has eighteen anal rays. It inhabits India, and appears to be of a mixed kind between oviparous and viviparous.

COSTATUS. Second dorsal fin is fleshy; a single row of scales on the sides; the tail is bifid. It inhabits South America and India.

CATAPHRACTUS. Second dorsal fin of one ray; a single row of scales on the sides; the tail is entire. It inhabits South America.

Section D. *Eight Cirri.*

Species.

ASPREDO. Dorsal fin single, five-rayed. It is found in the rivers of America. The base of the lateral cirri broad; the back carinate; the anal fin reaching to the tail; the tail is forked.

MYSTUS. The dorsal fin is single, and single-rayed. It inhabits the Nile: the tail is forked.

ANGUILLARIS. Dorsal fin single, seventy-rayed. It is found in the Nile: the upper part of the head is greenish; the body above the lateral line is marbled with blackish and grey; the belly and lower jaw are of a reddish-grey; the pectoral fins are transversely divided by a broad red band.

BATRACHUS. Dorsal fin is single, and sixty-rayed. It inhabits Asia and Africa: the tail entire.

UNDECIMALIS. The dorsal fin is single, and eleven-rayed. It inhabits Surinam: the tail is forked.

CATUS. Second dorsal fin fleshy, anal twenty-rayed. It inhabits Asia and America.

COUS. Second dorsal fin fleshy, anal eight-rayed; tail forked. It inhabits Syria: the cirri are shorter than the head.

DOCMAC. Second dorsal fin fleshy, anal ten-rayed. The length of the fish of this species is about three feet. It is of a grey colour, whitish beneath: the head is depressed; body convex above; mouth furnished with eight beards, the exterior ones of the upper lip extending half the length of the body; the lateral line is straight, and situated nearer the back than the abdomen; the first ray of the dorsal and anal fins long and serrated, with soft tip. It is a native of the Lower Nile, towards the Delta.

BAJAD. Second dorsal fin fleshy, anal twelve-rayed. It is about a foot in length; the colour is glaucous; the head obtuse, depressed, and marked on each side, before the eyes, by an unequal pit or depression; the upper jaw is longer than the lower; exterior beards of the upper lip very long; lateral line at first descending, then straight; above the pectoral fins on each side is a very strong spine, serrated in a reversed direction; the fins are rufous; the second dorsal or adipose fin is long; the tail is long, dilated towards the tip, and forked. It is a native of the Nile.

Species.

CORNUTUS. First ray of the first dorsal fin serrate; pectoral unarmed. It is not more than eight or nine inches long; the shape is oval; body carinated beneath; the snout is straight, compressed, a little recurved at the tip, and about half the length of the body; the first ray of the first dorsal fin extending as far as the middle of the tail, and serrated beneath for about half its length. It is a native of the Mediterranean.

IMBERBIS. The gill-covers with two spines on the hind part. It inhabits Japan, and is about six inches long; the body is funnel-shaped, reddish, and coated with scales. It is a native of the Indian and South American rivers.

SILURUS is also a name given by some authors to the sturgeon, called by others *acipenser*, but by the generality of writers *flurio*.

SILURUS Mons, in *Ancient Geography*, a mountain of Hispania, in the vicinity of Bœtica.

SILUUM, a town of Asia Minor, in the interior of Pamphylia. Ptolemy.

SILYBUM, in *Botany*, a name borrowed from Dioscorides, whose *συλιβον* is described as a large kind of thistle, eatable when young, if dressed with oil and salt. A liquor, which exuded from its root, was given, in the dose of a drachm, mixed with water, to excite vomiting. Gærtner, after Vaillant, has applied the name in question to a genus of his own, under which he brings together *Carduus marianus* and *Cnicus cernuus* of Linnæus, two very dissimilar plants.

SIM, in *Geography*, a river of Russia, which runs into the Yenisei; 6 miles N. of Balagovetschenkoi. N. lat. 60° 10'. E. long. 90° 40'.

SIMA, or **CYMA,** in *Architecture*, a term used by Wolfius, and some other writers, for what we otherwise call *cymatium*, or *simatium*.

SIMABA, in *Botany*, the name of a shrub in Guiana, described by Aublet, 400. t. 153; for which, being barbarous, Schreber has substituted the more legitimate, if not more harmonious, one of **ZWINGERA**; see that article hereafter.

SIMÆTHUS, or **SIMETUS,** now *Giaretta*, or *St. Paul*, in *Ancient Geography*, a river in the eastern part of Sicily, which passed through the territory of the city of Leontini, and which was celebrated by the poets. The nymph Thalia, after her amour with Jupiter, is supposed to have been converted into this stream, which, to avoid the rage of Juno, sunk under ground near mount Ætna, and continued this subterraneous course to the sea. In the time of the Romans it was navigable. It takes its rise on the N. side of Ætna, and surrounding the west skirts of the mountain, falls into the sea near the ruins of the ancient Morgantio. It does not now sink under ground; but throws up near its mouth great quantities of amber, which the peasants gather, and carry to Catanea, where it is manufactured in the form of crosses, beads, saints, &c. and is sold at very high prices to the superstitious people on the continent. There is a large sandy beach, that extends from the mouth of this river a great way to the S. of Catanea, and was, without doubt, continued the whole way to the foot of the mountain Taorminum; but it was broke in upon, at a remote period, by the lavas of Ætna, which, from a low sandy shore, have now converted it into a high, bold, black iron coast. After piercing through the lava, beds of shells and sea-sand have been discovered.

SIMALISCHEVA, in *Geography*, a town of Russia,

in the government of Kolivan; 40 miles S.S.E. of Kolivan.

SIMANA, in *Ancient Geography*, a town of Asia, in Bithynia, situated between two rivers.

SIMANCAS, in *Geography*, a small town of Spain, in the province of Leon, near the confluence of the rivers Pisuerga and Duero, celebrated for a white wine, that is very much esteemed. In the time of Philip II. it was a strong place, in which he ordered the archives of the kingdom to be kept. It was taken by the Moors in the year 967; 8 miles S.W. of Valladolid.

SIMAR, a town of Hindoostan, in the circar of Gohud; 14 miles E. of Gohud.

SIMARA, one of the smaller Philippine isles; 24 miles E. of Mindanao. N. lat. 12° 5'. E. long. 121° 40'.

SIMARIA, a town of Naples, in Calabria Ultra; 4 miles E.N.E. of St. Severina.

SIMARONA, a name given by the Spaniards in America to a species of vanilla, called also *bastard-vanilla*. The pods of this kind are every way smaller than those of the true kind, and have very little liquor or pulp in them when broken, and contain very few seeds. These are greatly inferior to the true kind, having scarcely any smell. It is not yet certainly known whether this species be the fruit of a different kind of vanilla-plant from the common, or whether it be the fruit gathered at a different season, or from a plant growing in a different soil. See **VANILLA**.

SIMARONES, in *Geography*, a town of the island of Cuba; 105 miles E. of Havana.

SIMAROUBA, or **SIMARUBA,** in *Botany*, is the bark of the roots of a tree, first imported into Europe in the year 1713, but not long ago botanically ascertained to be a species of the *Quassia*; which see.

SIMAROUBA, or **SIMARUBA,** in the *Materia Medica*. This bark, according to Dr. Wright's account of it, is rough, scaly, and warted. The inside, when fresh, is a full yellow, but when dry, paler; it has but little smell: the taste is bitter, but not disagreeable. Macerated in water, or in rectified spirit, it quickly impregnates both menstrua with its bitterness, and with a yellow tincture. It seems to give out its virtue more perfectly to cold, than to boiling water; the cold infusion being rather stronger in taste than the decoction; which last, of a transparent yellow colour whilst hot, grows turbid and of a reddish-brown as it cools. The milky appearance, which Jussieu says it communicates to boiling water, Dr. Wright has not observed in the decoction of any of the specimens which he has examined.

The bark was first sent from Guiana to France, in 1713, to the count de Porchartrain, then secretary of state, as a remedy of great efficacy in dysentery. In the years 1718 and 1723, an epidemic flux prevailed very generally in France, which resisted all the medicines usually employed in such cases; small doses of ipecacuanha, mild purgatives, and all astringents, were found to aggravate, rather than to relieve, the disease: under these circumstances, recourse was had to the cortex simaruba, which proved remarkably successful, and first established its medical character in Europe. Dr. Wright says, "most authors who have written on the simaruba, agree, that in fluxes it restores the lost tone of the intestines, allays their spasmodic motions, promotes the secretions by urine and perspiration, removes that lowness of spirits attending dysenteries, and disposes the patient to sleep; the gripes and tenesmus are taken off, and the stools are changed to their natural colour and consistence. In a moderate dose it occasions no disturbance or uneasiness, but in large doses it produces sickness at the stomach and vomiting.

"Modern physicians have found from experience, that this medicine is only successful in the third stage of dysentery, where there is no fever, where too the stomach is no way hurt, and where the gripes and tenesmus are only continued by a weakness of the bowels. In such cases, Dr. Munro gave two or three ounces of the decoction every five or six hours, with four or five drops of laudanum; and found it a very useful remedy. The late sir J. Pringle, Dr. Huck Saunders, and many others, prescribed the cortex simaruba in old and obstinate dysenteries and diarrhœas, especially those brought from warm climates. Fluxes of this sort, which were brought home from the siege of Martinico and the Havannah, were completely and speedily cured by this bark. The urine, which in those cases had been high-coloured and scanty, was now voided in great abundance, and perspiration restored. Dr. James Lind, at Haflar Hospital, says, that the simaruba produced these effects sooner, and more certainly, when given in such quantity as to nauseate the stomach. Dr. Huck Saunders remarks, that if the simaruba did not give relief in three days, he expected little benefit from its farther use; but others have found it efficacious in fluxes, after a continued use for several weeks. My own experience, and that of many living friends, are convincing proofs to me of the efficacy of this medicine, and I hope the simaruba bark will soon be in more general use."

Dr. Wright recommends two drachms of the bark to be boiled in twenty-four ounces of water to twelve; the decoction is then to be strained and divided into three equal parts, the whole of which is to be taken in twenty-four hours, and when the stomach is reconciled to this medicine, the quantity of the bark may be increased to three drachms. To this decoction some join aromatics, others a few drops of laudanum to each dose.

Dr. Cullen says, that the virtues ascribed to simaruba have not been ascertained by his own experience, or that of the practitioners in Scotland. Woodv. Med. Bot.

SIMAROW, in *Geography*, a town of Hindoostan, in Bahar; 13 miles S.S.W. of Arrah.

SIMARUM MUSCULUS, in *Anatomy*, a name given by some of the old writers to a muscle, called by the moderns the *ferratus magnus*.

SIMAS, in *Ancient Geography*, a promontory in the Euxine sea, on which Venus had a statue.

SIMATIUM, or SIMAISE, in *Architecture*. See CYMATIUM.

Simatium and *cymatium* are generally confounded together, yet they ought to be distinguished; the latter being the genus, and the former the species.

Simatium, of *fima*, camous, according to Felibien, is the last and uppermost member of grand corniches, called particularly the great *doucine*, or *gula recta*; and by the Greeks, *epititheta*.

In the antique buildings, the simatium, at the top of the Doric cornice, is generally in form of a cavetto, or semiscotia; as we see particularly in the theatre of Marcellus. This some modern architects have imitated; but, in the Ionic order, the simatium is always a *doucine*.

The simatium, or *doucine*, then, is distinguished from the other kinds of cymatia, by its being camous or flat-nosed.

SIMBALATH, in the *Materia Medica*, a name given by Avicenna and others to the spikenard, or *nardus Indica*.

The exact interpretation of the word is *spicigera*, and Avicenna, under this general name, distinguishes it into several kinds; the first he calls *alnardin*, or *nardin*. It has been supposed by some that he means the Indian spikenard

by this word; but, on the contrary, it appears plainly that he means the Celtic nard: he calls it the *nardus Romani orbis*, and says that it is of European growth. After this he mentions the Asiatic nards of several kinds, which are only the Indian spikenard, growing in different places, and such as used to be brought thence in different degrees of perfection.

SIMBANI, in *Geography*, a tract of country in Asia, abounding with woods, and uncultivated, lying between the kingdom of Woolli to the north-west, Foota Torra to the north, Bondou to the north-east, and Tenda to the south-west.

SIMBING, a town of Africa, in Ludamar; 5 miles S.W. of Jarra.

SIMBIRSK, a town of Russia, and capital of a government, on the Volga; 380 miles E.S.E. of Moscow. N. lat. 54° 25'. E. long. 48° 30'.

SIMBIRSKOE, a government of Russia, bounded on the north by Kazanskoe, on the west by Nizgorodskoe and Penzenskoe, on the south by the government of Saratov, and on the east by Uphinskoe; about 180 miles from east to west, and 140 from north to south. N. lat. 52° 20' to 55° 30'. E. long. 45° to 51°.

SIMBOLAN, a town of South America, in the province of Tucuman; 85 miles S.E. of Rioja.

SIMBULETA, in *Botany*, altered by Forskall from the Arabic *Symbulet ennesem*.—Forsk. *Ægypt-Arab.* 115. Juss. 418.—Class *Didynamia*; Order probably *Angiospermia*. Nat. Ord. uncertain.

Eff. Ch. "Calyx five-cleft. Corolla bell-shaped, ringent. Anthers combined."

Descr. "Stem annual, a foot high, simple, slender, erect, round, with some appearance of angles. Leaves scattered, near to each other, linear-thread-shaped; the upper ones simple, half an inch long; lower an inch long, in two deep, pointed, smooth divisions. Cluster terminal, four inches in length. Flowers solitary, drooping, on short stalks, with a short, linear, leafy bractea under each. Calyx a perianth of one leaf, bell-shaped, permanent, in five linear equal segments. Corolla of one petal, ringent, white; tube bell-shaped, longer than the calyx; upper lip of the limb reflexed, cloven; lower longest, three-lobed, straight, its middle lobe inflexed. Filaments four, inserted into the corolla, two of them longest. Anthers four, black, united into a quadrangular compressed plate. Germen ovate. Style thread-shaped. Stigma capitate, ovate, nearly globose, oblique. Fruit not observed. The aspect of the plant is exactly that of a *Refeda* or *Polygala*; it moreover approaches the character of *Columnnea*, as to the combined anthers, but differs in many other respects." Found on mount Kurma, and no where else, by Forskall, whose description has not enabled any learned botanist to guess at the plant, except that Jussieu thinks it may be akin to *Veronica*, or to Aublet's *Piripea*. We should rather suspect an affinity to *Antirrhinum*.

SIMCOE LAKE, in *Geography*, a lake of Upper Canada, formerly lake Aux Claires, situated between York and Gloucester, and communicating with lake Huron. It has a few small islands; and several good harbours.

SIMELIUM, a Latin term, used by some to signify a table, with ranges of little cavities in it, for the disposing of medals in chronological order.

The word is but ill written; it should rather be *cimelium*, as being formed of the Greek *κειμήλιον*, *curiosities*, or a cabinet of precious things.

We more usually say, a cabinet of medals, than a *simelium*.

SIMENA, in *Ancient Geography*, a town of Asia Minor, in Lycia. Steph. Byz.

SIMENAU, in *Geography*, a town of Prussia, in the province of Oberland; 8 miles E. of Salfeld.

SIMEON, in *Scripture Biography*, a son of Jacob and Leah, born in the year 1757 B.C. (Gen. xxix. 37.) Simeon and Levi revenged the affront, sustained by the defilement of their half-sister Dinah on the part of Schechem, the son of Hamor, by entering the town of Schechem, and killing all the men they found; after which they brought away Dinah, in the year 1739 B.C. (Gen. xxxiv. 25.) It has been thought that Simeon was the most cruel to his brother Joseph, and that he advised his brethren to sell him. (Gen. xxxvii. 20.) The conjecture is founded on the circumstance of his being detained prisoner in Egypt (Gen. xlii. 24.), and of his being treated with greater rigour by Joseph than the rest of his brethren. Jacob, on his death-bed, manifested peculiar indignation against Simeon and Levi. (See Gen. xlix. 5.) Accordingly the tribes of Simeon and Levi were dispersed in Israel. Levi had no compact lot or portion; and Simeon received for his portion only a district dismembered from the tribe of Judah (Josh. xix. 1, 2, &c.), and some other lands which were over-run by those of this tribe on the mountains of Seir, and in the desert of Gedor. (1 Chron. iv. 24. 39. 42.) The Targum of Jerusalem, and the rabbins, who have been followed by some of the fathers, have affirmed, that the greater part of the scribes and men learned in the law were of this tribe; and as these were dispersed throughout Israel, we perceive the accomplishment of Jacob's prophecy, which foretold that Simeon and Levi should be scattered among their brethren. It has been suggested, however, that the dispersion of Simeon and Levi, which Jacob meant to be a degradation, was in the progress of events over-ruled so as to be an occasion of honour; for Levi had the priesthood, and Simeon had the learning or writing-authority of Israel; in consequence of which both these tribes were honourably dispersed throughout Israel. According to the testament of the twelve patriarchs, a book indeed of no authority, Simeon died at the age of 120 years.

The sons of Simeon were six, and are enumerated Exod. vi. 15. Their descendants amounted to 59,300 men, at the Exodus (Numb. i. 22.); but the number of those that entered the Land of Promise amounted only to 22,200, the rest having died in the desert. (Numb. xxvi. 14.) The portion of Simeon was west and south of that of Judah; having the tribe of Dan and the Philistines north, the Mediterranean west, and Arabia Petraea south. Josh. xix. 1—9. Calmet.

SIMEON is also the name of that aged and pious person, mentioned Luke, ii. 25, 26, to whom Jesus Christ was presented by his parents in the temple, and who pronounced upon them his blessing. It is believed, with good reason, that he died soon after he had borne his testimony to Christ. Some, indeed, have pretended, that this Simeon was the same as Simeon the just, the son of Hillel, and master of Gamaliel, whose disciple St. Paul was.

SIMEON, or SIMON, was also the name of our Lord's cousin-german, son of Cleophas and of Mary, the sister of Christ's mother, probably the same with him who is named Simon by St. Mark (ch. vi. 3.) He was probably one of our Lord's first disciples. According to Eusebius, he was unanimously elected bishop of Jerusalem, after the death of St. James, A.D. 62. When the emperor Trajan made strict inquiry for all who were of the race of David, Simon was accused before Atticus, the governor of Palestine; and having endured many sufferings with a fortitude which asto-

nished observers, at the age of 120 years, he was crucified about A.D. 107; so that he had superintended the church of Jerusalem about 43 years. The Latins place his feast February 18, the Greeks April 27.

SIMEON, in *Biography*, the son of Jochai, a very celebrated man among the Jews, was a scholar of the rabbi Akiba, and flourished about the year 120. At the insurrection excited by Barchocheba, he fled, through fear of the Romans, and retired to a cave, where he concealed himself twelve years, in the course of which he is said to have composed his work, entitled "Sohar," which is an explication of the five books of Moses. This, from its abstract manner, and the matter being clothed, according to the Egyptian method, in hieroglyphical images and very florid language, is not easily understood. There are several editions of it, but its exact age is not known. It contains things that are very old; but it is admitted by Christians, as well as Jews, who held it in esteem, to be the production of more authors than one, and to have been enlarged, from time to time, by various additions. Gen. Biog.

SIMEON, surnamed *Metaphrastes*, an ecclesiastical writer, lived in the tenth century, under Leo the philosopher and his son Constantine Porphyrogenitus. He was a native of Constantinople, and rose to high employments at court, having been secretary to the emperors, and the medium of communication between them and foreigners. His writings indicate a man conversant in ecclesiastical affairs. He derived his surname of Metaphrastes, or Translator, from his occupation of writing again, in a different style, not translating, the lives of the saints. In this business he evidently meant to give a panegyric, rather than a true history; whence he has made additions and alterations at pleasure, so that the subjects are represented not as they were, but as he imagined they ought to be. His "Lives of the Saints" have several times been translated into the Latin language. Simeon likewise composed sermons, hymns, and prayers, with various pieces of the religious kind, of which some have been printed, and others remain in manuscript.

SIMEON, named *Stylites*, a distinguished person in the annals of fanaticism, was born about the year 392 at Sison, a town on the borders between Syria and Cilicia. He was the son of a shepherd, and followed the same occupation to the age of thirteen, when he entered into a monastery. After some time he left it, in order to devote himself to a life of greater solitude and austerity, and he took up his abode on the tops of mountains, or in caverns of rocks, fasting sometimes, it is said, for weeks together, till he had worked himself up to a due degree of extravagance. He then, to avoid the concourse of devotees, but probably to excite still greater admiration, adopted the strange fancy of fixing his habitation on the tops of pillars, whence the Greek appellation; and with the notion of climbing higher and higher towards heaven, he successively migrated from a pillar of 6 cubits to one of 12, 20, 36, and 40. This feat was considered as a proof of extraordinary anxiety, and multitudes flocked from all parts to pay their veneration to the holy man, as he was denominated. Simeon passed 47 years upon his pillars, exposed to all the inclemency of the seasons. At length a horrible ulcer put an end to his life, at the age of 69. His body was taken down from his last pillar by the hands of bishops, and conveyed to Antioch, with an escort of 6000 soldiers; and he was interred with a pomp equal to any thing that had been displayed for the most potent monarchs. He has been enrolled among the saints, either in the Greek or Latin churches. These honours produced imitators, whose performances surpassed the original. One of them inhabited his pillar 68 years.

The madness remained in vogue till the twelfth century, when it was suppressed.

SIMEON BEN JOCHAI. See CABBALA.

SIMERCHEIT, in *Geography*, a town of Bohemia, in the circle of Boleslaw; 4 miles N. of Melnik.

SIMEREN, a river of Syria, which runs into the Euphrates, at Romkala.

SIMERING, a town of Austria; 4 miles S.S.E. of Vienna.

SIMI, or SYMI, an island in the Mediterranean, between the island of Rhodes and the continent of Asia; 6 miles N. of Rhodes. N. lat. $36^{\circ} 36'$. E. long. $37^{\circ} 34'$.

SIMIA, in *Natural History*, a genus of the class and order of Mammalia Primates, of which the generic character is, that the individuals have four front teeth in each jaw, which are approximate; the tusks are solitary, longer, and more remote; the grinders obtuse. The animals of this genus greatly resemble man in the uvula, eye-lashes, hands, feet, fingers, toes, nails, and other parts of the body; they, however, differ widely in the total want of reason: they have retentive memories, are imitative, and full of gesticulations; chatter with their teeth, and grin: they macerate their food in the cheeks before they swallow it: they are filthy, lascivious, thieving, gregarious, and the prey of leopards and serpents, the latter pursuing them to the summits of trees and swallowing them entire.

This race of animals, which is very numerous, is almost confined to the torrid zone; they fill the woods of Africa, from Senegal to the Cape, and from thence to Ethiopia: a single species is found beyond that line, in the province of Barbary: they are found in all parts of India, and its islands; in Cochinchina, in the south of China, and in Japan; and one kind is met with in Arabia: they swarm in the forests of South America, from the isthmus of Darien as far as Paraguay.

These animals, from the structure of their members, have many actions in common with the human kind; most of them are fierce and untameable; some are of a milder nature, and will shew a degree of attachment: they feed on fruits, leaves, and insects; inhabit woods, and live in trees: they go in large companies. The different species never mix with each other, but always keep apart: they leap with great activity from tree to tree, even when loaded with their young, which cling to them: they are not carnivorous, but, for the sake of mischief, will rob the nests of birds of the eggs and young; and it is observed, that in those countries where apes most abound, the feathered tribe discover singular sagacity in fixing their nests beyond the reach of these invaders.

Mr. Ray first distributed the animals of this genus into three classes, viz. the *simia*, or apes, such as wanted tails; the *cercopithecii*, or monkeys, such as had tails; and *papiones*, or baboons, those with short tails.

From Ray, Linnæus formed his method, which was followed by M. de Buffon, who made a farther sub-division of the long-tailed apes, or true monkeys, into such as had prehensile tails, and such as had not.

The genus is divided into the following sections:

Section A. APES without any tail.

—— B. BABOONS with short tails.

—— C. MONKIES. Tails long, not prehensile; cheeks pouchèd; haunches naked.

—— D. SAPAJOUS. Tails prehensile; no cheek-pouches, and their haunches are covered.

—— E. SAGOINS. Tails not prehensile; no cheek-pouches; haunches covered.

Of the whole genus, says Dr. Shaw, it may be observed that the baboons are commonly of a ferocious and fullen disposition. The larger apes are also of a malignant temper, except the orang-outang and the gibbons. The monkeys, properly so called, are extremely various in their dispositions; some of the smaller species are lively, harmless, and entertaining; while others are as remarkable for the mischievous malignity of their temper, and the capricious uncertainty of their manners. It is no easy task to determine with exact precision the several species of this extensive genus; since, exclusive of the varieties in point of colour, they are often so nearly allied as to make it difficult to give real and distinctive characters. We shall, as usual, follow Gmelin's *Systema Naturæ* of Linnæus, in which there are sixty-four species delineated.

Section A. APES without Tails.

Species.

TROGLODYTES, or Angola Ape. The generic character is, that the head is conic, body brown, back and shoulders hairy, the rest of the body smooth.

SATYRUS; Orang-outang. Rusty-brown, hair of the fore-arms reversed, haunches covered. Besides this there are two varieties: 1. Without cheek-pouches, or callosities on the haunches. This variety always walks erect. Its trivial name is Pongo. It inhabits Java and Guinea, and is from five to six feet high. 2. The other variety resembles the former, but is above half as high: it is docile, gentle, and grave, and by some thought to differ from the other only in age.

Of these animals, the species which has most excited the attention of mankind is the orang-outang, or, as it is often denominated, the satyr, great ape, or wild man of the woods. It is a native of the warmer parts of Africa and India, and also of several of the Indian islands, where it resides principally in the woods, and is supposed to feed, like most other of this genus, on fruits. The orang-outang appears to admit of considerable variety in point of colour, size, and proportion; and there is reason to believe, that in reality there may be two or three kinds, which, though nearly approximated as to general similitude, are yet specifically distinct. The specimens imported into Europe have rarely exceeded the height of two or three feet, though full-grown ones are said to be six feet in height. The general colour seems to be of a dusky brown; the face is bare; the ears, hands, and feet nearly similar to the human; and the whole appearance is such as to exhibit the most striking approximation to the human figure. The likeness, however, is only general, and will not bear the test of examination; and the structure of the hands of the feet, when observed with anatomical correctness, seems to prove that the animal was principally designed by nature for walking on four legs, and not for an upright posture, which is only occasionally assumed, and which is thought to be the effects of instruction rather than truly natural.

The manners of the orang-outang, when in captivity, are gentle, and perfectly void of that disgusting ferocity which is often conspicuous in some of the larger baboons and monkeys. It is mild and docile, and may be taught to perform a variety of actions in domestic life. But, however docile and gentle when taken young, and instructed in its behaviour, it is possessed of great ferocity in its native state, and is considered a very dangerous animal, capable of readily overpowering the strongest man. Its swiftness is equal to its strength; and hence it can rarely be obtained in its full-grown state.

M. Vofmaer's account of the manners of the orang-outang brought into Holland in 1776, and presented to the prince of Orange, is nearly as follows. It was a female, about 2½ Rhenish feet. It shewed no symptoms of fierceness and malignity, and was of rather a melancholy appearance. It was fond of company, and shewed a marked preference to those who took daily care of it, of which it seemed very sensible. When the company retired, it would frequently throw itself on the ground, as if in despair, uttering lamentable cries, and tearing in pieces the linen within its reach. Its keeper having sometimes been accustomed to sit near it on the ground, it took the hay off its bed and laid it by its side, and seemed, by every demonstration, to invite him to be seated near. Its usual manner of walking was on all fours, but it could walk on its two hinder feet only. One morning it got unchained, and was seen to ascend the beams and rafters of the building with wonderful agility, and it was with the utmost difficulty retaken and secured. During its state of liberty it had taken out the cork from a bottle of Malaga wine, which it drank to the last drop. It would eat every thing that was offered, but was not observed to hunt for insects like other monkeys; it was fond of eggs, but fish and roasted meat seemed its favourite food. It had been taught to eat with a spoon and fork. Its common drink was water, but it would drink any kind of wine. At the approach of night it lay down to sleep, and prepared its bed by shaking well the hay on which it slept, and putting it in proper order, and lastly covering it with a coverlet. This animal lived seven months in Holland. On its first arrival, it had but little hair, except on its back and arms, but on the approach of winter it became well covered, and the hair on the back was full three inches long. The whole animal then appeared of a chestnut-colour; the skin of the face, &c. was of a mouse-colour, but about the eyes and round the mouth it was of a dull flesh-colour. It was imported from the island of Borneo. See ORANG-OUTANG.

In Dr. Gmelin's edition of the *Systema Naturæ*, says Dr. Shaw, the smaller variety, or the jocko, in its less shaggy or more naked state, is given as a distinct species under the name of *S. troglodytes*. The print published many years past, by the name of Chimpanzee, is of this kind. (See CHIMPANZEE.) The animal described in the 59th volume of the *Phil. Transf.* is by Gmelin referred to the orang-outang; but Mr. Pennant describes it under the title of Golok. It has a pointed face; long and slender limbs; arms, when the animal is upright, not reaching lower than the knees; head round, and full of hair; grows to the height of a man. It inhabits the forests of Mevat, in the interior parts of Bengal. In its manners it is gentle and modest, distinguished from the orang-outang by its slender form. In colour it is entirely black. In the *Philosophical Transactions* the description is as follows. "The animal is said to be the height of a man, the teeth white as pearls; the arms in due proportion, and the body very genteel."

LAR, or long-armed Ape, has its haunches naked; its arms as long as its body: it is found in India, is gentle, slothful, impatient of cold and rain, and is four feet high. There are two other varieties, of which the first is about eighteen inches high, the face and body brown. The second has its body and arms covered with silvery hair; the face, ears, crown, and hands, are black. It inhabits the forests of Deval, in Bengal; is playful, gentle, and elegant: about three feet high. The lar, or, as it is sometimes denominated, the gibbon, is distinguished by the length of its arms, which, when the animal stands upright, are capable of touching the ground with its fingers; hence its trivial name. Notwith-

standing the apparent ferocity of the lar, and the deformity of its figure, which is extremely well given by Dr. Shaw, it is of a tractable and gentle nature, and has even been celebrated for the decorum and modesty of its behaviour. Considered with respect to the rest of the genus, it ranks among the genuine apes, or those which have not the least vestige of a tail; and, says the naturalist already quoted, alarms the pride of mankind, by too near an approach to the real primates of the creation.

SYLVANUS; Pigmy. Haunches naked; head roundish; arms shorter. It inhabits Africa and the island of Ceylon; is mild and easily tamed; it uses threatening gestures when it is angry, chatters when pleased, salutes after the manner of the Hottentots, and drinks from the palm of the hand. The face is short and flat; the forehead transversely projecting at the regions of the eye-brows; the skin is rough; the hair on the neck and fore-arms reversed: it is about eighteen inches high.

INUVS; denominated by Buffon the Magot, and by Pennant the Barbary Ape. Its haunches are naked, and the head oblong. Inhabits Africa, is fond of the open air, deformed, dirty, and melancholy. It a good deal resembles the *S. sylvanus*, but its snout is longer, colour paler, nails rounded, and is about three feet and a half high. This is what is commonly seen in the exhibition of such kind of animals: it is not remarkable for docility or good temper; but, by force of discipline, it is made to exhibit a greater degree of intelligence than many others. Its colour is an olivaceous-brown, paler or whiter beneath; the face is of a swarthy flesh-colour. The hands and feet have nails resembling the human. It is destitute of any real tail, but there is commonly a short skinny appendix in the place of one.

This animal inhabits many parts of India, Arabia, and all parts of Africa, except Egypt, and a small number is found on the hill of Gibraltar, which breed there. These apes are very ill-natured, mischievous, and fierce, agreeing with the character of the ancient cynocephali: they are often exhibited to play tricks; assemble in great troops in India; and will attack women going to market, and rob them of their provisions. The females carry their young in their arms, and will leap from tree to tree with them.

SUILLA; or Hog-faced Ape. Nose blunt, truncate, resembling that of a hog.

Section B. BABOONS with short Tails. See BABOON.

NEMESTRINA. Beard thin; colour grey; eyes hazel; haunches naked. It inhabits Sumatra and Japan; is lively, gentle, tractable, and impatient of cold. The face is naked and tawny; the nose is flat; lips thin, with hairs resembling whiskers; hair on the body olive-black; belly reddish-yellow: it is about two feet high. This species is figured by Mr. Edwards, who was in possession of the living animal, and who, in order to compare his specimen with a much larger animal of the same species, carried it to Bartholomew fair, and he said they seemed highly delighted with each other's company, though it was the first time of their meeting: the best figure of this species is said to be that given by Buffon.

APEDIA; Little Baboon. Thumb close to the fingers; nails oblong, thumb-nails rounded; haunches covered. This is an inhabitant of India. The nails are oblong and compressed, except the thumb and great toe-nails, which resemble those of a man; the tail is scarcely an inch long; the face is brown, with a few scattered hairs.

SPHINX; Great Baboon. Mouth with whiskers; nails acuminate; haunches naked. This is found in the island of Borneo; it is lascivious, robust, and fierce; it feeds on
fruits

fruits and feeds; it makes great havock in the produce of cultivated lands. The head is oblong, resembling that of a dog, but more obtuse; the neck is long; the tail is short and erect; the haunches red, edged with purple; it is from three to four feet high in its sitting posture. It is extremely strong and muscular in its upper parts, and slender towards the middle. It is, says Dr. Shaw, ferocious in its manners, and its appearance is at once grotesque and formidable. The region surrounding the tail to a considerable distance on each side is bare and callous. It is a native of Borneo, and inhabits the hotter parts of Africa.

MORMON; Tufted Ape. Beard thin; cheeks tumid, naked, blue, obliquely furrowed; haunches naked, red. It inhabits India. This, in an upright posture, is full five feet high. It is the most remarkable of the whole genus for brilliancy and variety of colour. The general tinge is a rich and very deep yellowish-brown; the hairs, if viewed near, are speckled with yellow and black. The form of the face is long, with the snout ending somewhat abruptly; the whole length of the nose, down the middle, is of a deep blood-red; but the parts on each side are of a fine violet-blue, marked by several oblique furrows. The remainder of the face is of a pale whitish-yellow. On the top of the front the hair rises, in a remarkable manner, into a pointed form, and beneath the chin is a pointed beard of a light orange-yellow. Round the back of the neck the hair is much longer than in other parts, and inclines downwards and forwards, somewhat in the manner of a wreath or tippet. The hands and feet are of a dusky colour, and are furnished with broad pointed claws. It is a native of the interior parts of Africa, but has been found in India.

MAIMON; Ribbed-nose Ape. Beard thin; cheeks blue, striate; haunches naked. It inhabits Guinea; weeps and groans like men, when in trouble; it is libidinous, ugly, and disgusting. The general likeness which it bears to the former species is such as to give the idea of the same animal in a less advanced state of growth, and with less brilliant colours. The chin is furnished with a small sharp-pointed beard of a pale orange-colour. The feet are armed with claws, and have no flattened nails. This baboon is not uncommon in exhibitions of animals.

PORCARIA; Hog Baboon. The head of this species resembles that of a hog; the snout is naked; the body of an olive-brown; the haunches are covered, and the nails are acuminate. It is said to be three feet six inches in length; its colour is of a deep olive-brown; the face is large and black; the nose is truncated at the end, somewhat like that of a hog.

SYLVATICA; Wood Baboon. Face, hands, and feet naked, black, smooth; nails white. It inhabits Guinea, and is about three feet high. It is of a robust frame. Its general colour is ferruginous, owing to the alternate blackish-brown rings with which every hair is marked, and which give a kind of speckled appearance to the whole. The nails on the hands are longish, but rounded at their extremities; those on the toes longer and acuminate. The space on each side the tail is large, bare and red: the tail is about three inches long.

VARIEGATA; Yellow Baboon. This species is of a bright yellow colour mixed with black; the face is long, black, naked; the hands are covered on the back with hair. It very much resembles the *sylvatica*, and is found in Africa. Above the eyes are several long dusky hairs: it is about two feet high.

CINEREA; Cinereous Baboon. The face of this is dusky; the beard is of a pale brown; the crown is variegated with

yellow; the body is cinereous. It is found in divers parts of Africa, and is about two feet high.

LIVEA; Blue-faced Baboon. The face of this species is blueish; it has two broad flat fore-teeth; the beard is pale brown. Over the eyes are long hairs; the ears with a tuft of hair behind each; the hair is black mixed with cinereous and rusty-brown: this is three feet high.

PLATYPYGOS; Brown Baboon. The face is of a dirty white, surrounded with short straight hairs. The upper part of the body is brown, under cinereous; tail tapering, almost bare; it is naked beneath. This species, according to La Cépède, is the same with the long-legged baboon described in the additions to Buffon. The figure there given is the same with that in Mr. Pennant's *Quadrupeds*. The distinguishing character of the animal seems to be the great length of its limbs.

CRISTATA; Crested Baboon. In this species the hair on the crown of the head and cheeks is long and dishevelled. The body is covered with long black hair; the breast is whitish; the face, hands, and feet are black and naked; the tail is tapering, and about seven inches long; the animal is two feet high. It is an inhabitant of India.

Section C. MONKIES with long Tails, that are not prehensile; the Cheeks are pouched, and the Haunches naked.

CYNOSURUS; Dog-tailed Monkey. It has no beard; the face is long; the forehead foxy; it has a whitish band over the eyes; male genitals coloured; the nails are convex. It is about two feet high, and is said to be faithless, restless, and lascivious. The face of this animal appears uncommonly mild and placid. It was very fond of snuff, which it would occasionally rub over its body in a very ridiculous style.

HAMADRYAS; Tartarian Monkey. This is described as cinereous; the ears are hairy; the nails sharpish; the haunches red. It inhabits Africa, is fierce and very singular in its appearance. The face is prominent; the nose smooth and red; the ears are pointed, and almost hidden in fur; the hair on the sides of the head, and as far as the waist, long and shaggy; the nails of the fingers are flat, those of the toes acute and narrow: it is about five feet high. There is a variety, of which above the forehead is prominent, terminating in a ridge. It inhabits the Cape of Good Hope, is very gregarious, pillages gardens, and is watchful of surprise; the head is large; the nose is long and thick; the ears short; the crown is covered with long upright hairs; the body is rough and hairy; the tail is about half the length of the body, arched at the end; the nails are flat and rounded; the haunches are red, and the animal is from four to five feet high.

VETER; Lowando. The beard is black; the body is white. There is a variety with a white beard. It is found in Ceylon, is wild, ferocious, and mischievous. The tusks of this species are long and large; the head is surrounded with a broad mane; the body is long and tapering: it is between three and four feet high.

SILIENS; Wanderu. The beard of this animal is long and black; and the body is black. There are three other varieties of this species. The first has a bushy beard, is found in Ceylon, and other parts of India. The second is of a jet black colour; the beard is white, and very long; it inhabits Guinea, and is about two feet high. The third has a white beard, which is triangular, short, and pointed, extending on each side beyond the ears. It inhabits Ceylon, is harmless, and lives in the woods; it feeds on leaves and buds, and is easily tamed; the body is black; the face and hands

SIMIA.

hands are purple; the tail is long, ending in a dirty white tuft.

FAUNUS; Malbrouck. This species is bearded; the tail is bushy at the end; it is an inhabitant of Bengal; the face is grey; the eyes are large; the eye-lids are flesh-coloured; forehead with a grey band, instead of eye-brows; the ears are large, thin, flesh-coloured; body is blackish; the breast and belly are white; the beard is hoary and pointed: it is scarcely a foot high.

CYNOMOLGUS; Long-tailed, beardless monkey, with callosities behind, rising bifid nostrils, and arched tail. This by Pennant is called the Hare-lipped monkey, who includes in the species the cynomolgus and cynocephalus of Linnæus. It is of a thick clumsy form, resembling the Barbary ape, except in having a long tail. It varies in size very greatly; some specimens scarcely exceed the size of a cat, while others are full as large as a grey-hound. The colour also is various, being sometimes olive-brown, at other times grey-brown. The head is large; the eyes are small; the nose thick, flat, and wrinkled; on each side the tail is a bare space; the under sides of the body, and the insides of the limbs, of a light ash-colour. It is a native of Guinea and Angola. The nostrils are divided like those of a hare.

CYNOCEPHALUS; Dog Monkey. This has no beard; it is of a yellowish colour, has a projecting mouth, a straight tail, and bald haunches. It is found in divers parts of Africa, and resembles the *S. inuus*, except that it has a tail.

DIANA; Spotted Monkey. This species is bearded; the forehead is projecting; the beard is pointed. This is described by Mr. Pennant as of a middling size, and of a reddish colour on the upper parts, as if tinged, and marked with white specks; the belly and chin are whitish; the tail is long. According to Linnæus, it is of the size of a large cat, and is black, spotted with white; the hind part of the back is ferruginous; the face is black; from the top of the nose is a white line, passing over each eye to the ears in an arched direction.

SABÆA; Green Monkey. This animal has no beard; it is of a yellowish-green colour; the face is black; the tail is grey; the haunches naked. It inhabits the Cape de Verd islands, the Cape of Good Hope, and other neighbouring countries. The body in the upper parts is a mixture of grey, green, and yellowish; throat, breast, belly, and thighs are white; the hairs are long and reversed; the eye-brows are black and bristly; the tail is straight, as long as the body, and hoary; the feet are cinereous; the nails round, those of the hands ovate. It is about the size of a cat.

CEPHUS; Moustache. Tailed; cheeks bearded; crown yellowish; feet black; tail rusty at the point. It inhabits Guinea. The body above is brown; beneath it is of a blueish-white; the head with white erect hairs; eye-brows with a white transverse arch; upper eye-lids white; hair on the cheeks standing out; the mouth is blueish; under the ears are two large tufts of yellow hairs, like moustachios.

ÆTHIOPS; White eye-lidded Monkey. This is without tail and beard; the fore-top is white, erect; the arch of the forehead is white. There is a variety, of which the neck and cheeks are surrounded with a broad collar of white hair. It is found in Madagascar. Its face is thick and broad; the eyes are surrounded by a prominent ring; the eye-lids are naked, very white; the ears are black, almost naked; the tail is arched, covered with long bushy hair: it is about eighteen inches high.

AYGULA; Egret. This is tailed, the beard is scanty; the colour is grey; crown with an erect tuft of hair reversed

longitudinally. It inhabits India and Java. The body is a good deal like that of a wolf; the throat, breast, and belly whitish; the tail is longer than the body, cinereous, and tapering; the face is flattish, whitish, naked; the nose is depressed, short, and distant from the mouth, with a double furrow on the upper lip; the cheeks are a little bearded; the hairs are turned back; the eye-brows are gibbous, bristly, prominent; the feet are black, semi-palmate; the nails of the thumbs and great toes are rounded, the rest oblong; the ears are pointed; an arched suture from the ears towards the eyes and back to the base of the lower jaw, and a longitudinal seam on the fore-arm. There is a variety that has a rounder head; the face is less black; the body is of a paler brown.

NICTITANS. Tailed, beardless, black, sprinkled with pale spots; the nose is white; the thumb very short; the haunches are covered. This is called the Nodding monkey. There is a variety of it having a long white beard. It inhabits Guinea, is playful, and continually nodding its head. The face is hairy; the mouth short; the orbits naked; the irids of a pale yellow; the hair is black, with a few pale rings; lips and chin whitish; the tail is straight, cylindrical, longer than the body; the thumb is not longer than the first joint of the fore-finger.

SINICA; Chinese Monkey. Tailed, beardless; fore-top horizontally placed, and shading the whole head. There is a fore-top erect, having the appearance of a round black bonnet; the body is brown; the legs and arms black. The species is found in Bengal, and the variety in India. The tail is longer than the body; the nails of the thumbs and great toes are rounded, the rest oblong; the upper parts of the body are pale brown, mixed with yellow; the lower whitish. It is about the size of a cat.

NEMÆUS; Cochinchina Monkey. This is without tail and beard; the cheeks are bearded; and the tail white. It inhabits, as its trivial name imports, Cochinchina; also Madagascar, and other places. The face and ears are of a light red; the forehead is marked with a double brown band, covered with black hair; the hair surrounding the face is whitish, mixed with yellow; neck, on the upper part, with a wreath of the same colour as that of the forehead; the shoulders and upper parts of the arms black; hands and groin whitish; thighs on the upper part and toes black; feet to the knees brown; it is from two to four feet high. From this species is procured the bezoar of the ape.

MONA; Varied Monkey. This species is tailed and bearded; it has a prominent whitish-grey semi-lunar arch over the eye-brows. It inhabits Morocco, and the warmer parts of Asia; is gentle, docile, and patient of cold. The head is small and round; the face is bright, and of a tawny brown; the hair on the crown is yellow, mixed with black; it has a dark band from the eyes to the ears, and to the shoulders and arms; tail is greyish-brown; the rump is marked with two white spots on each side. It is eighteen inches high.

RUBRA; Red Monkey. This species is tailed and bearded; the cheeks are bearded; the crown, the back, and the tail, are of a deep blood-red. There are two other varieties; the first has a yellow beard; the band over the eyes is black: the second has a white beard; the band over the eyes is white. This is found in Senegal, Congo, and other hot parts of Africa. The crown is flat; the body and legs are long; the hair on the upper parts is of a bright red, beneath it is of a yellow-grey; over the eyes to the ears is a band. One variety is black; and another is white;

white; the tail is longer than the body. It is from eighteen inches to two feet in height.

TALAPÖIN. This is tailed and bearded; the cheeks are bearded; the ears, nose, and soles of the feet black. It inhabits India. The body is of a brownish-green, and elegant. A variety is of a black colour. The head is roundish; the face is tawny, with a few black hairs; the ears are like those on the human subject; the breast, belly, and thighs on the inside are of a dusky flesh-colour; it is extremely gentle and playful, and is of the size of a cat.

PETAURISTA; Agile Monkey. This animal is tailed and bearded; its back, upper part of the tail, anterior parts of the legs, dark olive; its face is black, and the nose is marked with a triangular white spot. It inhabits Guinea, and is, like the last, gentle and docile; it is little more than a foot high, though the tail is twenty inches long.

MAURA; Negro Monkey. This is tailed and bearded; the cheeks, whole face, except the region extending from the eyes to the tip of the nose, are bearded; the body is of a reddish-brown. It inhabits Ceylon and Guinea, is active and gentle. The tail is longer than the body; the face is tawny and flesh-coloured; the feet and hands are black, naked, and soft. In a sitting posture it is only about seven inches high.

ROLOWA. This species is tailed and bearded; the head, back, and outside of the hands and feet, are black; the inside, belly, and circular beard, enclosing a triangular face, are white. This is an inhabitant of Guinea; is gentle and docile. The beard is long and forked: it is eighteen inches long, with a tail of the same length.

NASUA. This has no beard; the face is long, slender, naked, flesh-coloured; the nose is projecting. It inhabits Africa, and is good-tempered. The head is covered with thick longish hair, falling backwards; the ears are small, pointed, and almost naked; the hair on the upper parts and limbs is long, rusty-brown mixed with black; on the breast and belly it is ash-coloured; the tail is very long: in a sitting posture it is only two feet high.

LUTEOLA; Yellow Monkey. In this species the tusks are very large; the ears also are large, black, naked; the cheeks have long pale-yellow locks reversed. It inhabits Guinea. The crown, upper parts of the body, arms, and thighs, are of an ash-colour, mixed with yellow; the lower parts are cinereous; the face is black, with long hairs over the eyes; the throat and breast are of a yellowish-white; the hair is coarse; the tail is as long as the body, and it is about the size of a fox.

FULVA; Tawny Monkey. This has tusks in the lower jaw, which are long; the face is long and of a flesh-colour; the nose is flattish. The hair on the upper part of the body is pale tawny, though cinereous at the roots; the hind part of the back is of an orange-colour; the legs are cinereous and the belly white. It is of the size of a cat. It inhabits India. Pennant, who seems to be the only describer of this animal, took the description from one in an exhibition in London, which was an extremely ill-tempered animal. It is said to vary with a black face, and long black hairs on the cheeks; the body is of a dull pale-green; the limbs are grey and the tail dusky.

VIRIDENS. The face of this is black; the cheeks have long black hairs; the body is of a pale-green; the limbs are grey; the tail is dusky. It is thought by some naturalists not to be a distinct species, but a variety of the *S. fulva*.

HIRCINA. Face naked, blue, obliquely ribbed; the beard is long, and like that of a goat; the tail is long, and the body of a deep brown.

VOL. XXXII.

REGALIS. To this species there is no thumb; the head, cheeks, throat, and shoulders, are covered with long coarse flowing hairs. It inhabits the forests of Sierra Leona. The head is small; the face is short, black, naked; the toes are long and slender; the nails are narrow and pointed; the tail is long, covered with snow-white hairs, and a tuft at the end; the body and limbs are slender: it is three feet high. The skin of this animal is, by the natives, made into pouches and gun-bags.

BODIA; Bay Monkey. This has no thumbs; the tail is long, slender, and black; the body and limbs are slender. It inhabits Sierra Leona. The crown is black; the back is of a deep bay; limbs on the outside black; cheeks, under parts of the body, and legs, of a bright bay.

FUSCA; Brown Monkey. The tail shorter than the body, alternately annulate with dark and light-brown. The face is flat; the cheeks and forehead are covered with long hairs; the body above is of a tawny-brown, belly cinereous; hands black and naked.

Section D. *Tails prehensile; no Cheek-pouches; Haunches covered. These are denominated*

SAPAJOUS.

BEELZEBUL, or Bearded Black Monkey. By Pennant it is denominated the Preacher monkey. It is tailed, bearded, and black. The tail at the tip and feet are brown. It inhabits South America; wanders in herds at night, and howls hideously; it is exceedingly fierce; the beard is round and black; the hair long, black, and smooth. For the account given of this animal by Marcgrave, see **BEELZEBUL**.

SENICULUS; Old Man of the Woods. This is tailed and bearded; the colour is red. The body is uniformly of a dirty red; it has a mouth like that of the human subject, placed in the anterior part of the face; the chin is prominent, and it is as large as a middling-sized calf. This, which by some has been regarded as a variety of the *S. beelzebub*, is denominated by Mr. Pennant the Royal monkey. There were formerly two in the Leverian museum, which were probably young, being of the size of a squirrel. They were entirely of a very bright ferruginous or reddish chestnut colour, with the face naked and black, surrounded on the lower parts by a fragging beard of black hairs, and the tail was strongly prehensile. This species is common in Cayenne, but very rare in Brazil: on the contrary, the former species is very common in Brazil, but is not found in Guiana. Both species have the same voice and manners. The following is an interesting description given by an observer, who had seen and kept these animals at Cayenne.

"The *Alouates*, or Howlers, inhabit the moist forests, in the neighbourhood of waters or marshes. They are commonly found in the woody islets of large flooded savannahs, and never on the mountains of the interior of Guiana. They go in small numbers, often in pairs, and sometimes singly. The cry, or rather horrible rattling scream, which they make, may well inspire terror; and seems as if the forests contained the united howlings of all its savage inhabitants together. It is commonly in the morning and evening that they make this clamour: they also repeat it in the course of the day, and sometimes in the night. The sound is so strong and varied, that one often imagines it produced by several of the animals at once, and is surprised to find only two or three, and sometimes only one. The *alouate* seldom lives long in a state of captivity: it in a manner loses its voice, or at least does not exert it in the same manner as when wild. The male is larger than the female, which latter always carries her young on her back.

SIMIA.

“ Nothing is more difficult than to kill one of these animals. It is necessary to fire several times in order to succeed, and as long as the least life remains, and sometimes even after death, they remain clinging to the branches by the hands and tail. The sportsman is often chagrined at having lost his time and ammunition for such wretched game; for, in spite of the testimony of some travellers, the flesh is not at all good; it is almost always excessively tough, and is, therefore, excluded from all tables: it is merely the want of other food that can recommend it to needy inhabitants and travellers.”

PANISCUS. This is the four-fingered monkey of Pennant; it is tailed, black, beardless, and without a thumb, hence its trivial name. This animal is distinguished by the gracility of its body and limbs; its uniform black colour, except on the face, which is of a dark flesh-colour; and by want of thumbs on the fore-feet, instead of which are very small projections or appendices. It is one of the most active and lively of animals, and is, besides, of a gentle and tractable disposition in a state of confinement. It inhabits the woods of South America; associating in great multitudes, assailing such travellers as pass through their haunts with an infinite number of sportive and mischievous gambols, chattering, and throwing down dry sticks, swinging by their tails from the boughs, and endeavouring to intimidate the passengers by a variety of menacing gestures. This is the *Coaita* of Buffon.

EXQUINA. Bearded; back variegated with black and yellow; throat and belly white. It inhabits South America. In size and disposition it resembles the *S. paniscus*.

TREPIDA. Tailed, but without a beard; the fore-top is erect; hands and feet are blue; the tail is hairy. A variety has the hair round the face grey; it is brownish-yellow on the body. It inhabits Surinam, is nimble, dextrous, and amusing, and about twelve inches high. The body is brown, beneath it is rusty; the hair of the head is formed into a black erect hemispherical tuft; the tail is hairy; the nails are rounded; the face and ears downy and flesh-coloured; the eyes are approximate chestnut.

FATUELLUS. The horned sapajou is tailless and without beard; two tufts on the head resembling horns. It is found in several parts of South America, is harmless and gentle. The face, sides, belly, and front part of the thighs, are brown; the crown, the middle of the back, tail and feet, and hind part of the thighs, are black; the nails are long and blunt; the tail is spiral.

APELLA; Brown Sapajou, or Sajou of Buffon. This also is without tail and beard; the body is brown; the feet are black.

CAPUCINA; Capuchin Monkey, or Sai of Buffon, and Weeper of Pennant. This has no beard; the skin is brown; the hair and limbs are black; the tail is shaggy and the haunches are covered. There is a variety of this, of which the hair on the breast, throat, round the ears, and cheeks, is white. The face is sometimes black, sometimes flesh-coloured on the forehead; the tufts are approximate; the nose is carinate towards the eyes; a black varicose retractile wrinkle just under the hair of the forehead; the tail is long, always curved, and covered with long shaggy hair; it is of the size of a cat. It inhabits divers parts of South America; it is mild, docile, timid; walks on its heels, and does not skip. It has a crying wailing voice, and repels its enemies by horrid howlings; it shrieks sometimes like a cricket. When made angry it will yelp like a puppy; it carries the tail spirally rolled up, which is often coiled round the neck: it smells of musk.

SCIUREA; Orange Monkey, or Saimiri of Buffon. Beardless; the hind part of the head is prominent; the

nails of the four smaller toes ungulate; the haunches are covered. The body is of a greenish-grey, under parts whitish; the legs and arms are rusty; the tail is shaggy, black at the tip, and twice as long as the body; the nails of the thumbs and great toes are rounded; the face of a blueish-brown; the eye-brows are bristly; the ears are scantily covered with whitish hairs; it is of the size of a squirrel. It is found in South America; is pleasant in its disposition, beautiful, and graceful; it rests by lying on its belly. It looks full in the face of such as speak to it. It is impatient of European climates.

MORTA. Without beard, but it has a tail; it is of a chestnut colour; the face is brown; the tail is naked and scaly. It is found in different parts of America. It differs from the *S. sciurea* only in being less, and on that account it has been supposed to be of the same species.

SYRICHTA. This is without tail and beard; the mouth and eye-brows are covered with long hairs. This is an obscure and doubtful species.

VARIEGATA. The hair on the sides and back is mixed with orange and black. It inhabits Antigua, is lively, docile, and full of amusing tricks.

Section E. Monkeys with Tails that are not prehensile; that have no Cheek-pouches; the Haunches are covered. These are denominated

SAGAINS.

PITHECIA; Fox-tailed Monkey. Tailed, but without beard; the hairs of the body are long, and black at the tips; the tail is black, and very shaggy. It inhabits South America; is very amusing, and easily tamed. It is entirely of a dusky brown colour, with a slight ferruginous cast, except on the head and face. This is the *Saki* of Buffon.

JACCHUS; Striated Monkey, or Ouistiti of Buffon, and Sanglin or Cagui minor of Edwards. This is tailed; its ears are hairy, broad; tail curved, very hairy; nails subulate, those of the thumbs and great toes are rounded. There is a variety, which is of a yellowish colour, smelling like musk. It inhabits Brazil; is active, restless, climbing like a squirrel; it feeds on insects, fruits, milk, bread, and small birds; it gnaws the bark of trees, is untameable, biting, tormenting cats by fixing under their bellies, and emits a hissing cry.

ŒDIPUS; Red-tailed Monkey. This is tailed and beardless; locks hanging; the tail is red; nails subulate. The body is grey, underneath it is white; the head has long white hanging locks; its face is black, and it has a few white hairs behind the ears; a wart on each cheek; the irises are rusty; the ears are roundish, black, and naked; nails subulate, except the thumb; the tail is twice as long as the body, and is a little hairy, black, red at the base; the region of the anus is red. It inhabits South America, is active, brisk, imitating the lion in its gestures. It is something less than the *S. jacchus*; it smells of musk, and the voice resembles that of a mouse.

ROSALIA; Silky Monkey. Tailed; beardless; the head is hairy; circumference of the face and feet are red; the nails are subulate. This species derives its trivial name from the appearance of its hair, which is very fine, soft, long, and of a bright yellow colour, resembling yellow silk. Round the face the hair is much longer than in other parts, so as to form a large mane, like that of a lion; near the face this mane is of a reddish colour, and it grows paler as it recedes from the cheeks; the face itself is of a dusky purple; the ears are round and naked; the hands and feet are also naked, and of the same dull purple colour as the face; the claws are small and sharp; the tail is very long, and

and rather bushy at the extremity. It is a native of Guiana, and is a lively, active species, and gentle in a state of confinement. This is the Marikina of Buffon.

MIDAS; Tamarin. This species is tailless; beardless; the upper lip is cleft; the ears are square and naked; the nails are subulate. The tamarin, or great-eared monkey, is about the size of a squirrel; it is coal-black, except on the lower part of the back, which is of a reddish colour, and on the hands and feet, which are orange-coloured; the face is naked and flesh-coloured; the ears are very large, naked, of a squarish form, and of a dusky flesh-colour; the tail is very long and black. It inhabits the hotter parts of South America. The claws are small and sharp. It sometimes varies in having the face black, instead of flesh-coloured.

SIMIA Marina, the *Sea-Ape*, in *Ichthyology*, a name used by Bellonius, and some other authors, for the fish called *vulpes marina*, a kind of shark, remarkable for its long tail, from which probably it had both one and the other of these names. See *Sea-Fox*.

SIMICON, in *Antiquity*, an ancient musical instrument of the stringed kind, with thirty-five strings. Mem. de l'Acad. Inscript. vol. v. p. 168.

SIMICUS, in *Biography*, an ancient Greek musician, said to have been a great improver of music. He lived after Homer, and has the reputation of having invented the instrument above-mentioned; but Plutarch says, that the ancient Fables attribute this instrument to Pythocliclus. He also informs us, that the Argians fined the first person that used it; but does not tell us how it was used, or whether there was a complete scale for every one of the genera: 35 notes in the diatonic scale would mount it above the additional compass of modern piano fortes.

According to Pliny, Simicus added an eighth string to the lyre of Mercury. Boethius says that it was Lychaon of Samos; but Nichomachus gives it to Pythagoras. So many claimants to the same inventions destroy all evidence to whom they belong.

SIMILAR, in *Arithmetic* and *Geometry*, the same with *like*.

Those things are said to be similar, or like, which cannot be distinguished but by their compresence; that is, either by immediately applying the one to the other, or some other third to them both. So that there is nothing found in one of the similar things, but is equally found in the other.

Thus, if you note all the things in A, which may be discerned and conceived, without assuming any other; and, in like manner, note all the things in B, which may be thus conceived, and A be similar to B; all things in A will be the same with those in B.

Since a quantity cannot be understood otherwise, than by assuming some other quantity to which it may be referred; similar things, notwithstanding their similitude, may differ in quantity: and since, in similar things, there is nothing in which they differ, beside the quantity; quantity itself is the internal difference of similar things.

In mathematics, similar parts, as A, a, have the same ratio to their wholes B, b; and if the wholes have the same ratio to the parts, the parts are similar. Similar parts A, a, are to each other as their wholes B, b. See **PART**.

SIMILAR Angles are also equal angles. See **SOLID Angle**.

SIMILAR Rectangles are those which have their sides about the angles proportional.

Hence, 1°, all squares must be similar rectangles. 2°. All similar rectangles are to each other as the squares of their homologous sides.

SIMILAR Triangles are such as have all their three angles respectively equal to each other, and the sides about the equal angles proportional. See **TRIANGLE**.

Hence, 1°, since in all triangles mutually equiangular, the corresponding sides containing the equal angles are proportional, equiangular triangles are similar to each other. And if two triangles have their sides respectively proportional, those triangles are equiangular.

2°. All similar triangles are to each other, as the squares of their homologous sides.

In similar triangles, and parallelograms, the altitudes are proportional to the homologous sides, and the bases are cut proportionably by those sides.

SIMILAR Polygons are those whose angles are severally equal, and the sides about those angles proportional.

And the like of other similar rectilinear figures.

Hence, all similar polygons are, to each other, as the squares of the homologous sides.

In all similar figures, the homologous angles are equal, and the homologous sides proportional. All regular figures, and similar irregular ones, are in a duplicate ratio of their homologous sides. Circles, and similar figures, inscribed in them, are, to each other, as the squares of the diameters.

SIMILAR Arches. See **ARCH**.

SIMILAR Curves, in *Geometry*. The similarity of curvilinear figures may be derived from that of rectilinear figures, that are always similarly described in them; or, we may comprehend all sorts of similar figures, planes, or solids, in this general definition. Figures are similar, when they may be supposed to be placed in such a manner, that any right line being drawn from any determined point to the terms that bound them, the parts of the right line, intercepted betwixt that point and those terms, are always in one constant ratio to each other.

Thus the figures ASD, aSd (*Plate XIII. Geometry, fig. 14.*) are similar, when any line SP being drawn always from the same point S, meeting AD in P, and ad in p, the ratio of SP to Sp is invariable. It is manifest, that the rectilinear inscribed figures, apdS, APDS, are similar in this case, according to the definition of such figures given in Euclid's Elements, book vi. See Mac-laurin's Fluxions, art. 122.

When the similar figures are in the situation here described, they are also similarly situated, and all their homologous lines are either placed upon one another, or parallel.

SIMILAR Segments of Circles are such as contain equal angles. See **SEGMENT**.

SIMILAR Conic Sections are those where the ordinates to a diameter in one are proportional to the correspondent ordinates to the similar diameter in the other; and where the parts of similar diameters between the vertices and ordinates in each section are similar.

The same definition also agrees to similar segments of conic sections.

SIMILAR Diameters of two Conic Sections. When the diameters in two conic sections make the same angles with their ordinates, they are sometimes said to be similar.

SIMILAR Solids. See **LIKE Solid Figures**.

SIMILAR Bodies, in *Natural Philosophy*, such as have their particles of the same kind or nature one with another.

SIMILAR Plain Numbers are those which may be ranged into similar rectangles, i.e. into rectangles whose sides are proportional; as 6 multiplied by 2, and 12 by 4, the product of one of which is 12, and the other 48, are similar numbers.

SIMILAR Solid Numbers are those, whose little cubes may

be so ranged, as to make similar and rectangular parallel-epipeds.

SIMILAR Animals. We have a treatise by Dr. Martin, wherein he treats of the laws and proportions of the motions and forces of the solids and fluids of animals, of however different magnitudes, which are supposed of similar make and constitution. See *Traçtat. de Similibus Animalibus*.

SIMILAR Disease, in *Medicine*, denotes a disease of some simple, solid part of the body : as of a fibre, with regard to its tension, or flaccidity ; of a membrane ; a nervous canal, or the like. See **DISEASE**.

SIMILAR Parts, in *Anatomy*, are those parts of the body, which, at first sight, appear to consist of like parts, or parts of the same nature, texture, and formation.

Of these we usually reckon ten, *viz.* the bones, cartilages, ligaments, membranes, fibres, nerves, arteries, veins, flesh, and skin ; each of which see under its proper article.

Dr. Grew, in his *Anatomy of Plants*, observes, that these have likewise their similar and organical parts.

SIMILE, or **SIMILITUDE**, in *Rhetoric*, a comparison of two things, which, though different in other respects, yet agree in some one. As, *He shall be like a tree planted by the water-side*, &c. ; so that in every similitude three things are requisite ; two things that are compared together ; and a third, in which the likeness or similitude between them consists.

The difference between a *simile* and a *comparison* consists in this, that simile properly belongs to what we call the quality of the thing, and the comparison to the quantity.

And the difference between a metaphor and similitude consists in this, that a metaphor has not those signs of comparison which are expressed in a similitude. See **METAPHOR** and **PARABLE**.

SIMILITUDE, in *Arithmetic, Geometry*, &c. denotes the relation of two things similar to each other, or which are only distinguishable by comparison.

The notion of similitude, which now makes some figure in geometry, &c. is owing to M. Leibnitz : it will be rendered easy by the following instance. Suppose two watches perfectly alike, the one belonging to Caius, the other to Gracchus. If now Caius pull out his watch in presence of Gracchus, the latter will be surpris'd, and fancy it his own ; but he will perceive it different from his own, upon pulling out his own ; that is, Gracchus distinguishes Caius's watch from his own by their comparison ; or, by applying the one immediately to the other.

Euclid, and after him most other authors, demonstrate every thing in geometry from the sole principle of congruity. Wolfius, in lieu of it, substitutes that of similitude ; which, he tells us, was communicated to him by M. Leibnitz, and which he finds of very considerable use in geometry, as serving to demonstrate many things directly, which are only demonstrable from the principle of congruity by anambages.

SIMILOR is a name given to an alloy of red copper and zinc, made in the best proportions to imitate the colour of gold. See **GOLD-coloured Metal**.

SIMIRA, in *Botany*, Aubl. Guian. 170. t. 65. Juss. 205, the Guiana name of a shrub, belonging to the natural order of *Rubiaceæ*, and the *Pentandria Monogynia* of the Linnæan system, but of whose generic characters nothing has yet been precisely settled. It seems very near akin to **PSYCHOTRIA**, or to **STEPHANUM** ; see those articles.

SIMITAR, or **SCIMITAR**, in *War*, a crooked or falcated sword, with a convex edge ; not now used.

SIMLEE, in *Geography*, a town of Hindoostan, in Guzerat ; 17 miles N. of Champaner.

SIMLER, **JOSTAS**, in *Biography*, was born at Cappel, in Switzerland, in the year 1530. He was minister at Zurich, and a professor in the school of that town. He wrote several controversial works against some of the heretical sects, as they were esteemed, and denominated by him. He taught mathematics with great reputation, illustrating his lessons by various machines of his own invention. Of his writings the principal were "*De Helvetiorum Republica*," which contained an account of the original constitution of the Swiss confederacy ; "*Vallesia Descriptio*," being an account of the Valais, and the adjacent alps ; and an abridgement of the *Bibliotheca* of Conrad Gesner, with the life of that distinguished person. In this last work he has not only given a good summary of the original, but has rendered it more complete, by the addition of a number of books. He died at Zurich in 1576, at the time when he was preparing a history of his native country.

SIMLY, in *Geography*, a town of Hindoostan, in Orissa ; 15 miles N.W. of Boad.

SIMMEN, or **SIBEN**, a river of Switzerland, which rises in the mountains between the Valais and the canton of Berne, and runs into the lake of Thun ; 4 miles N.N.W. of Spiez. The valley through which this lake runs, and which has on each side stupendous rocks, is called "*Simmenthal*," and is divided by it into the Upper and Lower. The inhabitants of some few parts of this valley sow rye, oats, or wheat ; but they derive great profit from their grass, which is very rich, and they also breed a great number of cattle, from which they make butter and cheese. The latter sort of cheese, called "*Saan*" cheese, is much esteemed abroad, being made wholly of cream ; and of the common cheese, France and other countries purchase considerable quantities. Most of the inhabitants, instead of bread, eat the second sort of cheese, with thin barley cakes ; and the principal food of the commonalty is potatoes, and their drink is milk or whey.

SIMMERN, a town of France, and principal place of a district, in the department of the Rhine and Moselle, late capital of a duchy of the same name, vested in the electorate of the Rhine. The place contains 1469, and the canton 8361 inhabitants, in 31 communes. The territory of the district contains 1687½ kilometres ; 26 miles S.S.W. of Coblenz.—Also, a river of France, which passes by Simmern, Gemunden, &c. and runs into the Nahe ; 3 miles E. of Kirn.

SIMMIA CHUMBA, a town of Bengal ; 16 miles S. of Palamow.

SIMMONS'S ISLAND, a small island on the coast of South Carolina. N. lat. 32° 38'. W. long. 80° 10'.

SIMO, a town of Sweden, in East Bothnia, on a river of the same name, which runs into the gulf of Bothnia ; 80 miles E. of Ulea.

SIMOGU, a town of Hindoostan, in Mysoor, on the Tumbadra ; 93 miles W. of Seringapatam. N. lat. 13° 21'. E. long. 75° 30'.

SIMOJOSIKI, one of the smaller Japanese islands, near the S.W. coast of Ximo. N. lat. 31° 50'. E. long. 132° 8'.

SIMOIS, in *Ancient and Modern Geography*, a river of Asia Minor, in the Lesser Phrygia, the source of which was in mount Ida, and which discharged itself into the Xanthus, or the Scamander, according to Pliny. The source of the Simois lies S.W. of Cotylus ; it flows nearly to the W., traverses a space of from twelve to fifteen leagues ; receives the Andrius above Inchavi, and several other rivulets, and discharges

discharges itself into the Hellespont, half a league to the N.N.E. of cape Sigeum. This stream is not now sufficiently considerable to deserve the name of river; it is rather a torrent swelled by the rains, at the end of the autumn, in winter, and in the spring, or by the sudden melting of the snow, which falls on mount Ida and Cotylus. Its bed is tolerably wide, but its waters are seldom abundant, and in summer it is almost dry, since a pacha has turned aside the stream of the Scamander, and directed its waters into the Ægean sea. See SCAMANDER.

SIMON, in *Biography*, a name that frequently occurs in ancient history: some of the principal persons who sustained this appellation are as follow; viz.

SIMON *the Just*, high-priest of the Jews, was the son and successor of Onias I. and promoted to this dignity A.M. 3702, or 3703. He died A.M. 3711, before A.D. 293.—Also, SIMON, son of Onias II., advanced to the high-priesthood A.M. 3805, B.C. 199. In his time, A.M. 3787, Ptolemy Philopater came to Jerusalem, and attempted to enter the interior parts of the temple, where no one but the high-priest ought to have entered. Simon opposed him, and prevented his design. He is supposed to have been the person to whom the book of Ecclesiasticus gives a high encomium. His successor was Onias III.

SIMON *Maccabæus*, surnamed *Thassi*, the son of Mattathias, and brother of Judas and Jonathan, was chief, prince, and pontiff of the Jews from A.M. 3860 to 3869, B.C. 135. He gave proofs of his valour in the battle between Judas Maccabæus and Nicanor (2 Macc. viii. 22, 23.), and on another occasion (2 Macc. xiv. 17.) In consequence of his judgment and valour, which were signalized in a variety of ways, he was made governor of the whole coast of the Mediterranean sea, from Tyre to the frontiers of Egypt, by the young king Antiochus Theos. He also took Bethsura and Joppa, and built Adida, in the plain called Sephela. When Tryphon had slain Jonathan and his two sons, and having marched into Syria, put to death the young king Antiochus, and usurped his kingdom, Simon supported his competitor, Demetrius Nicator, who, at his request, confirmed the ancient franchises of Judea, and granted freedom from tribute. After this he took Gaza, and the Syrians that were in the citadel of Jerusalem capitulated to him. His administration was singularly prudent, and it was his great object to render his nation prosperous and secure. With this view he made a harbour at Joppa, for the improvement of the trade of the Jews, and he extended the limits of his country. He also renewed the alliance of the Jews with the Romans and the Lacedæmonians; and the whole Jewish nation acknowledged their obligations to him by various tokens of respect, and particularly by recompensing him and his children as perpetual prince and pontiff of their nation. When Demetrius Nicator was taken by the Parthians, Antiochus Sidetes, king of Syria, the brother of Demetrius, applied to him for succour against Tryphon, and not only confirmed the grants of his brother, but allowed him the privilege of coining money, remitted to him all debts owing to the kings of Syria, and declared Jerusalem to be a free and an holy city. Simon sent him men and money to assist him in the reduction of Dora, in which Tryphon had shut himself up. But Antiochus would not receive them, nor would he confirm the articles of his treaty with Simon. He also demanded the surrender of several places, and a thousand talents of silver, threatening, in case of refusal, to enter Judea with troops, and to treat him as an enemy. Simon disregarded his threats; nevertheless he offered a hundred talents for the cities of Joppa and Gazara, of which he had made himself master, because they occasioned great calamities to his country. The army of An-

tiochus, which he had sent to the coasts of the Mediterranean, was defeated by John Hyrcanus, the son of Simon; and three years afterwards Simon visited the cities of Judea, and came to the castle of Docus or Dagon, where his son-in-law Ptolemy, son of Ambubus, resided. But Ptolemy, though he entertained him magnificently, caused him, in the midst of the entertainment, to be massacred, together with his two sons Mattathias and Judas, hoping thus to become master of Jerusalem, and of the whole country. But John Hyrcanus arrived first at Jerusalem. Calmet.

SIMON *the Canaanite*, or *Simon Zelotes*, was an apostle of Jesus Christ. Zelotes, the appellation given to him by St. Luke (vi. 15. Acts, i. 13.) seems to be a translation of the surname Canaanite, given to him by the other evangelists. (Matt. x. 4. Mark, iii. 18.) Some learned persons have supposed, that the term Zelotes denoted his zeal in embracing the gospel of Jesus Christ; but others think, that he was of a sect called Zealots, mentioned by Josephus, (De Bell. l. iv. c. 2. l. vi. c. 1.) It does not appear where he preached, or where he died. Some have asserted that he travelled through Egypt, Cyrenaica, and Africa; that he preached in Mauritania and Libya, and that he propagated the gospel in Britain, closing his life by martyrdom, on the cross, which he endured with incredible courage. Others affirm, that he suffered martyrdom in the city of Sunir, in Persia, on the 28th of October, on which day the Latin church celebrates his festival. The Greeks honour him June 1, and say, that he was Nathanael, the bridegroom at the marriage of Cana.

SIMON *Magus*, or the *Sorcerer*, was a native, as it is said, of the village of Gitton, in the country of Samaria. His history is recited Acts, viii. 5—13. See also Acts, viii. 9, 10, 11. After having been discovered and resisted by the apostles, and particularly by Peter, he is said to have fallen into greater errors and abominations, applying himself more than ever to magic, and taking pride in opposing the apostles, and propagating his errors. It is said by several of the ancient fathers, that at Rome, whither he arrived in the time of the emperor Claudius, about A.D. 41, he was honoured as a deity by the Romans, and by the senate itself, and that a statue was decreed to him in the isle of Tyber, with this inscription: "Simoni Deo Sancto." This fact, however, is disputed by several able critics. It appears, that under the reign of Nero he acquired great reputation by his enchantments; and that he pretended to prove that he was the Christ, and that, as the son of God, he could ascend to heaven; and it has been said, that he really caused himself to be raised in the air, in a fiery chariot, by the assistance of two demons, but that by the prayers of St. Peter he was deserted by his demons, fell down and broke his legs, and afterwards, overcome by grief and shame, threw himself headlong from the top of the house where he lodged. But we shall not multiply these apocryphal stories, which are not worthy of recital. He died, probably, A.D. 65. Simon formed a sect of heretics, who were called *Simonians*; which see.

SIMON, a disciple of Socrates, whose occupation was that of a leather-dresser at Athens, and whose shop was resorted to by Socrates and his friends. He is said to have been the first who published the Socratic Dialogues; but none are extant. Simon so much valued freedom of inquiry, that when Pericles invited him to make his house his residence, with the promise of an ample recompence, he refused, alleging, that he would not sell the liberty of speaking his mind at any price.

SIMON, JOHN FRANCIS, an ingenious man of letters; was born at Paris in 1654. He was originally intended for the ecclesiastical profession, and took the degree of doctor
of

of laws. M. Pelletier de Souzy engaged him as preceptor to his son, and afterwards employed him as his own secretary, and as a remuneration for his services made him counsellor of the fortifications. He became very famous as a writer of inscriptions and legends of medals struck on public occasions, and on this account he was nominated a member of the Academy of Inscriptions and Belles-Lettres. He contributed several learned dissertations to the Memoirs of that body: and he read before it several parts of a medallic history of Lewis XIV. He was an excellent writer both in the Latin and French languages, and in verse as well as prose. In 1712 he was appointed keeper of the royal cabinet of medals. He died in 1719.

SIMON, RICHARD, a biblical critic, was born at Dieppe in 1638. He received his early education in the college of the Fathers of the Oratory in that place, and afterwards entered into that congregation. Quitting it in a very short time, he pursued the study of theology, and of the Oriental languages, in which he made a great proficiency. He entered himself again a member of the Oratory in 1662, when his singular turn of thinking, and unaccommodating temper, involved him in differences, which had nearly caused him to abandon the society for that of the Jesuits. These were, after a time, compromised, and he was sent as professor of philosophy to one of their colleges. The house of the Oratory in Paris possessing a library rich in Oriental writings, Simon was engaged to draw up a catalogue of them, on which occasion he became known to M. de La Moignon, first president of the parliament of Paris. Having performed the task, he returned to his professorship, and there employed himself in literary labours. In the year 1670 he was ordained priest, and in the same year he gave a proof of the liberality of his mind, by undertaking the defence of the Jews at Metz, who had been accused of sacrificing the child of Christian parents. In 1674 he published, under the name Ricared Simeon, "A Treatise on the Ceremonies and Customs at present preserved among the Jews, translated from the Italian of Leo of Modena, with a Supplement respecting the Sects of the Caraites and Samaritans." It was reprinted in 1681, with a supplement, containing "A Comparison between the Ceremonies of the Jews and Discipline of the Church." In 1678 he published "A Critical History of the Old Testament," which, by the boldness of some of its opinions, gave a considerable degree of offence; and though it was protected by the approbation of a doctor of the Sorbonne, and a royal privilege, an order was procured for prohibiting its sale, and the privilege was revoked. In the same year he quitted the Oratory, in order that he might enjoy that freedom which is natural to the mind, and of which he was enthusiastically fond. He was accustomed to express his sense of the advantages of liberty by repeating the words "Alterius ne sit qui suus esse potest." For the purpose of enjoying still more liberty, he resigned his cure four years after this, and spent the remainder of his life in the composition of several works, of which a great part was controversial. He died at Dieppe in 1712, at the age of 74.

Simon was a man of extensive and very deep learning, and an acute critic, but fond of singularity. Few men of letters have engaged in more disputes, and among his adversaries are some of the most eminent men of his time, Catholic as well as Protestant. He has, however, been ever regarded as one of those, who have much contributed to the free and learned discussions which have improved scriptural theology, and though not avowedly a reformer, he was an effective promoter of the Reformation. He published a number of works, and in addition to those already noticed, we may mention "Histoire critique du Texte du Nouveau

Testament;" "Histoire critique des Versions du Nouveau Testament;" "Histoire critique des principaux Commentateurs du Nouveau Testament;" "Nouvelles Observations sur le Texte et les Versions du Nouveau Testament;" "Une Traduction Française du Nouveau Testament, avec Remarques Litterales et Critiques," 2 vols. 8vo. This was condemned in the pastoral letters of Noailles, archbishop of Paris, and Bossuet, bishop of Meaux. "Bibliothèque Critique," 4 vols. published under the name of Sainjore, a work suppressed by order of council. "Nouvelle Bibliothèque Choisie," being a sequel to the former. "Lettres Critiques," 4 vols. "Critique de la Bibliothèque des Auteurs Ecclesiastiques de M. Dupin, et des Prolegomenes sur la Bible du même," 4 vols. 8vo. "Histoire Critique de la Croyance et des Coutumes des Nations du Levant." M. Simon left his MSS. and a number of printed books, with marginal notes written with his own hand, to the cathedral library of Rouen.

There was another Simon of some celebrity, a doctor of laws, the author of "A Dictionary of the Bible," explaining the geography of the Old and New Testament, and the ceremonies of the Jews, first printed at Lyons in 1693, and again in 1703, with considerable additions, forming two vols. folio.

SIMON, a great musician among the ancients, who, rejecting former rules of his art, invented a new mode, which was called "Simodia," from his name, in the same manner as the genus invented by Lyfes, was called Lyfodia.

SIMON, M., inventor of pedals for the harp, or *harp à pedale*. See HARP.

SIMON, in *Ichthyology*, a name by which some authors have called the dolphin. It is affirmed, that this fish loves the name, and will come to a person who calls him by it; but this, though recorded by authors of credit, meets with no faith among the judicious readers.

SIMON'S Bay, in *Geography*, a bay on the coast of Africa, 11 miles on the W. side of the Cape of Good Hope: this is the only convenient station for ships to lie in; for although the road without it affords good anchorage, it is too open, and but ill-circumstanced for producing necessaries, the town being small, and supplied with provisions from Cape Town, which is about 24 miles distant. The anchoring place is situated in S. lat. 34° 20', or 34° 23'. E. long. 18° 29'. In April 1780, the dip of the S. end of the magnetic needle was 46° 47', and variation of the compass 22° 16' W. On the full and change days it was high water at 5^h 55^m apparent time; the tide rose and fell 5 feet 5 inches; at the neap tides it rose 4 feet 1 inch. Cook's Third Voyage, vol. iii.

SIMONETTA, GIOVANNI, in *Biography*, an historian, was a native of Caslaro, in Sicily. In 1414 he entered into the service of Francesco Sforza, duke of Milan, of which prince his brother Cicco was the confidential minister. After the death of Francesco, he attached himself to his son Galeazzo Maria, to whom he, with his brother, continued so faithful, that when Ludovico Sforza usurped the dukedom, they were arrested and sent prisoners to Pavia. Cicco, in the following year, was beheaded, and Giovanni was banished to Vercelli. He, however, returned to Milan, where he was buried about the year 1491. Simonetta composed in Latin a history of the actions of Francesco Sforza from 1423 to 1466, which is accounted one of the best works of that time. It was several times printed. It is also found in Muratori's collection of Italian historians.

SIMONICAL is applied to a person guilty of simony; that is of purchasing a benefice, or other sacred matter, with money. See SIMONY.

SIMONIANS, or SIMONITES, in *Ecclesiastical History*, a sect

a sect of ancient heretics, the first that ever disturbed Christianity; if they might be said to do so, who were little more than mere philosophers, and chiefly made profession of magic.

Simon Magus, so often mentioned in the Acts, was their leader, and died under the emperor Nero; St. Peter still surviving; so that Clemens Alexandrinus is mistaken, when he makes Simon posterior to Marcion.

This impious man, says Mosheim, is not to be ranked among the number of those who corrupted with their errors the purity or simplicity of the Christian doctrine, nor is he to be considered as the parent and chief of the heretical tribe; but he is rather to be placed in the number of those who were enemies to the progress and advancement of Christianity. For it is manifest from all the records we have concerning him, that after his defection from the Christians, in consequence of the severe rebuke which he received from the apostle Peter, he retained not the least attachment to Christ, but opposed himself openly to the divine Saviour, and assumed to himself blasphemously the title of the *supreme power of God*. Orig. adv. Celsum. lib. v. p. 272. ed. Spenceri.

Simon was by birth a Samaritan, or a Jew; when he had studied philosophy at Alexandria, he made a public profession of magic, and persuaded the Samaritans, by fictitious miracles, that he had received from God the power of commanding and restraining those evil beings by which mankind were tormented. As for his doctrines, Mosheim adds, that he was, without doubt, in the class of those philosophers, who not only maintained the eternity of matter, but also the existence of an evil being, who presided, and thus shared the empire of the universe with the supreme and beneficent mind: and he, probably, embraced the opinion of those who held, that matter, moved from eternity by an intrinsic and necessary activity, had by its innate force produced, at a certain period of time, from its own substance, the evil principle which now exercises dominion over it, with his numerous train of attendants. From this pernicious doctrine, the other errors attributed to him concerning fate, the indifference of human actions, the impurity of the human body, the power of magic, and similar extravagancies, flow naturally, as from their true and genuine source.

He rejected the law of Moses, and said he was come to abolish it. He ascribed the Old Testament to the angels, and though he declared himself an enemy to them, he is said to have paid them an idolatrous worship.

This magician farther pretended, that in his person resided the greatest and most powerful of the divine æons; that another æon of the female sex, the mother of all human souls, dwelt in the person of his mistress Helena; and that he came, by the command of God, upon earth, to abolish the empire of those that had formed this material world, and to deliver Helena from their power and dominion. Mosh. Eccl. Hist. vol. i.

This sect is said to have continued to the fourth century. Justin, in his Apolog. 2, says that in his time, *i. e.* about A.D. 150, almost all the Samaritans, and some few others elsewhere, acknowledged Simon as the greatest of the gods. Clemens Alexandrinus (Shan. l. ii.) says that his followers worshipped him. About the year 240 this sect was reduced to about thirty persons, according to Origen (Cant. Celsum, l. i.); and elsewhere (l. v.), he says that they were quite extinct. But it appears from other testimonies, that some of them remained even at the beginning of the fifth century. Eusebius (Hist. Eccl. l. ii. c. 1.) speaks of Simonians, that mingled themselves among the Catholics, and received Catholic baptism; but who afterward spread in secret the venom of their doctrine. Several were discovered and ex-

pelled the church about the beginning of the fourth century. See Gnostics.

SIMONIDES, in *Biography*, a celebrated Grecian poet, born in the isle of Chios, was the son of Leoprepes, and flourished in the fifth century before the Christian era. He excelled in various kinds of poetry, but especially in the elegiac, for which, as we learn from Horace and Quintilian, he was almost proverbially famous in antiquity. One of his most famous compositions was entitled "The Lamentations," of which the following fragment is all that remains, but this justifies his title to great excellence as a writer.

"Sweet child! what anguish does thy mother know,
Ere cruel grief has taught thy tears to flow!
Amidst the roaring wind's tremendous sound,
Which threats destruction, as it howls around,
In balmy sleep thou liest, as at the breast,
Without one bitter thought to break thy rest.
While in pale, glimmering, interrupted light
The moon but shews the horrors of the night.
Didst thou but know, sweet innocent! our woes,
Not opiate's pow'r thy eye-lids now could close.
Sleep on, sweet babe! ye waves in silence roll,
And lull, O lull to rest! my tortur'd soul."

Simonides was endowed with a most extraordinary memory, and some have attributed to him the invention of the art of recollecting by localizing ideas, which has lately been brought into fashion in this country. The introduction of some of the compound letters of the Greek alphabet is also ascribed to him. He lived to an advanced age, and at the age of eighty gained a prize for poetry. According to Pliny, Simonides added the eighth string to the lyre. In his old age, perhaps from seeing the respect which money procured to such as had lost the charms of youth, and power of attaching mankind by other means, he became somewhat mercenary and avaricious. He was frequently employed by the victors at the games to write panegyrics and odes in their praise, before his pupil Pindar had exercised his talents in their behalf; but Simonides would never gratify their vanity in this particular, till he had first tied them down to a stipulated sum for his trouble; and, upon being upbraided for his meanness, he said, that he had two coffers, in one of which he had, for many years, put his pecuniary rewards; the other was for honours, verbal thanks, and promises; that the first was pretty well filled, but the last remained always empty. And he made no scruple to confess, in his old age, that of all the enjoyments of life, the love of money was the only one of which time had not deprived him. It is mentioned as a subject of dispraise, that Simonides was one of the first who wrote verses for money, and that he travelled through the cities of Asia, selling eulogies on the victors in the public games. He paid a visit, in advanced life, to Hiero, king of Syracuse, to whom he gave the celebrated answer respecting the nature of God that has been handed down from generation to generation to the present time in the writings of Cicero. Hiero having asked his opinion on the subject, he requested a day to consider of it; when this was expired, he doubled the time, and thus he did repeatedly, till the monarch desired to know his reason for this proceeding: "It is," said he, "because the longer I reflect on the question, the more difficult it appears to be." He was reported to be extremely avaricious; he was, however, justly ranked among the philosophers and poets, and though sensible of the value of money, he knew what was more valuable. Undergoing shipwreck on a voyage, while the other passengers encumbered themselves with their most valuable effects, he left his behind him, saying, "I carry with me all that is mine;" and when he arrived safe at Clazomene,

zomene, his fellow sufferers being either drowned or pillaged, he met with a citizen acquainted with his poetry, who liberally supplied all his wants. It was a witty reply which this author made to Hiero's queen, who demanded of him whether knowledge or wealth was most to be preferred: "Wealth," said he; "for I see every day learned men at the doors of the rich." When he was accused of being so fond, as to sell part of the provisions with which his table was furnished by Hiero, he said he had done it, in order "to display to the world the magnificence of that prince, and his own frugality." In justification of his passion for wealth, he said, "I choose rather to be useful to my enemies after I am dead, than burdensome to my friends while I am living." He is said to have been sufficiently eloquent to reconcile two princes extremely irritated against each other, and actually at war. He was unquestionably one of the most conspicuous characters of his time. Of his numerous works only a few fragments remain, which are published in the *Corpus Poetarum Græcarum*.

SIMONOR, in *Geography*, a small island in the Sooloo Archipelago. N. lat. $4^{\circ} 59'$. E. long. $119^{\circ} 50'$.

SIMONOSAKI. See *XIMONOSEQUI*.

SIMONTORNYA, or **SIMON THURN**, a town of Hungary, situated on the Sarand, with a strong castle, taken by the Imperialists in the year 1686; 32 miles S.S.W. of Buda. N. lat. $46^{\circ} 50'$. E. long. $18^{\circ} 25'$.

SIMONY, **SIMONIA**, the crime of trafficking with sacred things; particularly the corrupt presentation of any one to an ecclesiastical benefice for money, gift, or reward.

The word is borrowed from Simon Magus, who is mentioned in the Acts of the Apostles, as offering to buy the power of working miracles with money: though the purchasing of holy orders seems to approach nearer to his offence.

By the English canons, anno 1229, simony is not only committed by an agreement for money in hand, or to be paid yearly; but by any other profit or emolument; any reward, gift, or benefit, directly or indirectly; or by reason of any promise, grant, bond, &c. and this either in the acceptance of a living, or in an exchange or resignation.

Simony was by the canon law a very grievous crime; and it is so much the more odious, because, as sir Edward Coke observes, it is ever accompanied with perjury; for the presentee is sworn to have committed no simony. However, it was not an offence punishable in a criminal way at the common law; it being thought sufficient to leave the clerk to ecclesiastical censures: but many acts of parliament have been made to restrain it by means of civil forfeitures. Thus the statute of 31 Eliz. c. 6. enacts, that if any patron, for money, or any other corrupt consideration or promise, directly or indirectly given, shall present, admit, institute, induct, install, or collate any person to an ecclesiastical benefice or dignity, such presentation shall be void, and the presentee be rendered incapable of ever enjoying the same benefice, and the crown shall present to it for that turn only: moreover, both the giver and taker shall forfeit two years' value of the benefice or dignity; one moiety to the king, and the other to any one who will sue for the same. If persons also corruptly resign or exchange their benefices, both the giver and taker shall, in like manner, forfeit double the value of the money, or other corrupt consideration.

Farther, by the statute 12 Ann. stat. 2. c. 12, if any person, for money or profit, shall procure, in his own name, or the name of any other, the next presentation to any living ecclesiastical, and shall be presented thereupon, this is declared to be a simoniacal contract, and the party is subjected to all the ecclesiastical penalties of simony, is

disabled from holding the benefice, and the presentation devolves to the crown.

In the construction of these statutes, these points, says judge Blackstone, seem to be clearly settled.

1. That to purchase a presentation, the living being actually vacant, is open and notorious simony.

2. That for a clerk to bargain for the next presentation, the incumbent being sick and about to die, was simony, even before the statute of queen Anne; and now, by that statute, to purchase, either in his own name or another's, the next presentation, and be thereupon presented at any future time to the living, is direct and palpable simony.

But, 3. It is held, that for a father to purchase such a presentation, in order to provide for his son, is not simony; the son not being concerned in the bargain, and the father being by nature bound to make a provision for him.

4. That if a simoniacal contract be made with the patron, the clerk not being privy thereto, the presentation for that turn shall indeed devolve to the crown, as a punishment of the guilty patron; but the clerk who is innocent, does not incur any disability or forfeiture.

5. That bonds given to pay money to charitable uses, on receiving a presentation to a living, are not simoniacal, provided the patron or his relations be not benefited thereby; for this is no corrupt consideration, moving to the patron.

6. That bonds of resignation in case of non-residence, or taking any other living, are not simoniacal, there being no corrupt consideration therein, but such as is only for the good of the public. So also bonds to resign, when the patron's son comes to canonical age, are legal; upon the reason before given, that the father is bound to provide for his son.

7. Lastly, general bonds to resign at the patron's request, are held to be legal; for they may possibly be given for one of the legal considerations before-mentioned, and where there is a possibility that the transaction may be fair, the law will not suppose it iniquitous without proof; but if the party can prove the contract to have been a corrupt one; such proof will be admitted, in order to shew the bond simoniacal, and therefore void. Neither will the patron be suffered to make an ill use of such a general bond of resignation; as by extorting a composition for tithes, procuring an annuity for his relations, or by demanding a resignation wantonly, and without good cause, such as is approved by the law, as for the benefit of his own son, or on account of non-residence, plurality of livings, or gross immorality in the incumbent. Blackst. Comm. b. ii.

SIMONY is also committed by buying or selling the sacrament, baptism, ordination, or absolution; as well as by the nomination and collation to a benefice, a place in monastery, or the like.

By 31 Eliz. cap. 6, persons who shall corruptly ordain or license any minister, or procure him to be ordained or licensed, shall incur a forfeiture of 40*l.*, and the minister himself of 10*l.*, besides an incapacity to hold any ecclesiastical preferment for seven years afterwards. See **PRESENTATION**.

Some have pretended it to be sufficient to avoid the charge of simony, if only the ordination were gratuitous, though the revenues were bought and sold as a temporal thing. But the canons of several councils have condemned this subtle distinction; since the revenues are attached to an ecclesiastical office purely spiritual.

Casuits distinguish three kinds of simony; viz.

SIMONY, *Mental*, is that which is restricted to the mere will and inclination, without ever breaking forth into act. As when a present is made to a collator, without taking any notice, that we expect a benefice from him. This kind of simony is only punishable in *foro conscientia*.

SIMONY,

SIMONY, Conventional, is where there is an express act, and a formal bargain, though it never come to an execution.

SIMONY, Real, is where the convention is executed on both sides; which last is the most criminal of all. The canonical penalty of simony is deposition in a clerk, and excommunication in a layman.

It is a maxim among the Romish canonists, that there is no simony in the court of Rome; because the pope acts there as an absolute sovereign; they also say, that resignations *in favorem* are not to be admitted but by the pope, as favouring a little of simony. On these occasions, however, the parties always swear, that there had been no deceit, collusion, simony, or other illegal covenant.

Peter Damian distinguishes three kinds of simony: that of money, that of the tongue, and that of services.

SIMONY of Money, or *Per munus a manu*, is where money is really paid down for a benefice: he adds, that the same is likewise committed, by expending money to live at court to obtain a benefice.

SIMONY of the Tongue, or *Per munus a lingua*, consists in flattering the collator, or making one's self agreeable by complaisance and commendation.

SIMONY of Services, or *Per munus ab obsequio*, consists in doing for them good offices to obtain a benefice.

It was agreed by all the justices, Trin. oct. Jac. primi, that if the patron presented any person to a benefice with cure, for money; such presentation, &c. is void, though the presentee were not privy to it; and the statute gives the presentation to the king; but this is now repealed.

SIMORI, in *Geography*, a town of Naples, in Calabria Ultra; 13 miles N.E. of Squillace.

SIMORRE, a town of France, in the department of the Gers; 13 miles S.E. of Auch.

SIMPLA NOBLA, in *Botany*. See **PHYLLIS**.

SIMPLARY, **SIMPLARIS**, in *Antiquity*, a Roman soldier, who had only single pay. Thus called, in opposition to the *duplares*, or such as had double pay.

SIMPLE, **SIMPLEX**, something not mixed, or compounded; in which sense it stands opposed to *compound*.

SIMPLE Bodies or *Elements*, in *Chemistry*, are those substances which have not yet been decomposed.

In every era of chemical science, something like a system or theory has prevailed, which has had for its basis a certain number of bodies, called elements or simple bodies, of which all other bodies were formed. This has ever had the good effect of stimulating the minds of enquirers, and has tended much to the progress of this useful branch of philosophy. Theory has succeeded theory, varying widely from, and in some instances contradicting each other, till philosophers have become very cautious in the admission of the elementary nature of bodies; and hence have agreed in the above general definition of a simple body.

The limited proportions in which bodies combine, is sufficient to convince us, that simple bodies consist of hard unchangeable particles or atoms, which are not practically divisible. And the general forms of the crystals of compound matter go far to shew, that these atoms are spheres, a form the best calculated for motion, and under which they would be the least likely to change. How many varieties of these unchangeable spherical particles there exist, it is difficult to say; and what ratio they bear to each other, in density or magnitude, we are equally at a loss to determine. One great step, however, has been made, which may lead us to more important conclusions. Although we are ignorant of the absolute dimensions and densities of those atoms, we are now in a way to acquire a knowledge of their relative weights, by which we shall be enabled to calculate the proportions of compound bodies, by simply knowing of what

elements they are composed. The use of experiment will be to find out the elements of a compound, and rudely guess at its proportions; but the exact proportion will require to be determined by calculations, which will render chemistry as complete as astronomy.

There is the greatest reason to believe, that the atoms of simple matter attract each other by the same laws with gravitation. Sir Isaac Newton supposes, that in gold, which in his time was considered the densest body, the pores or interstices between its particles greatly exceed its material part. Of what density, therefore, must we consider the atoms of bodies. Our present idea of density is very vague, and varies with the temperature, and depends, therefore, upon the quantity of caloric they contain. If these atoms were to be finally deserted by the caloric, they would come in contact; and if they were spheres, the resulting specific gravity would be $\frac{4}{3}$ of the specific gravity of the atoms themselves. The caloric, on the contrary, if deserted by the atoms, would, from its repellent property, be dispersed to an unlimited extent. When, however, these two species of matter combine, they still retain their original properties; but the attraction of the atoms decreases, as they recede, by new additions of caloric in a less ratio than the repulsion of the caloric, and the two powers are kept in equilibrium by change of distance between them. If the attraction be as the square of the distance, and the repulsion as the cube; then, if the distances be successive intervals of 1, 2, 3, &c. the attractions at these points will be 1, $\frac{1}{4}$, $\frac{1}{9}$, &c. and the repulsion 1, $\frac{1}{8}$, $\frac{1}{27}$, &c. Therefore, the caloric at each point, to make the atoms stand in equilibrium at these respective distances, will be 1, 2, 3, &c. for $1 \times 1 = 1$, $\frac{1}{8} \times 2 = \frac{1}{4}$, $\frac{1}{27} \times 3 = \frac{1}{9}$, and so on. It is under this form that the specific gravity of a body is taken; but we know not what may be the density of the real atoms, although we know that it must be very considerable. In proportion as this is the case, we are to expect a greater attractive force agreeably to the laws of gravitation. If the earth were to be condensed to half its diameter, the weight of bodies on its surface would be quadrupled. This circumstance, aided by the proximity of the atoms in chemical combination, and the state of aggregation, in which solids exist, will make us cease to wonder at the powers of chemical attraction, and at the same time gives a lively hope, that the same attraction is common both to gravity and chemical combination. However indeterminate this problem may appear, we understand that some experiments are soon to be instituted for settling this point.

The experiments will in the first place determine, whether these attractions are the same, or not: if they are the same, the experiments will determine, and point out the numbers which will express the strength of affinity between different bodies; the only facts which are now wanting to make chemistry a complete science.

In the present state of chemical science, those bodies considered as elements are divided into two classes; the one called combustible or inflammable, and the other supporters of combustion; because in combining with the first class, much light and heat are developed.

The first class, which is by far the most numerous, consists chiefly of metals, with only a few exceptions. These are exhibited in the following table, which also contains the weights of their atoms and specific gravities; hydrogen, the lightest atom, being 1.

If the views of Gay Lussac, the French chemist, be correct, in a memoir on Jodine, or Iodine, which has been published in Dr. Thomson's Annals, we shall be hardly warranted in drawing this line between the combustible bodies, and those

SIMPLE BODIES.

which support combustion. Some of the latter appear to act the part of both. This is evidently the case with sulphur, which gives light and heat to a certain extent in its combination with some of the metals, and also when it combines with oxygen, with which, as an inflammable body, it forms an acid. In the opposite characters, like chlorine and iodine, it forms an acid with hydrogen, which is now termed the hydrosulphuric acid. Gay Lussac goes farther, and supposes that phosphorus, carbon, and azote, have a similar double property. Carbon he supposes to be the acidifying principle of some of the vegetable acids, and that azote acts a similar part in the prussic acid.

Simple Combustible Bodies.

Names.	Weight of its Atom.	Specific Gravity of Hydrogen being
Gold - - - - -	140	191673
Silver - - - - -	100	104849
Platinum - - - - -	100	227700
Palladium - - - - -	-	117523
Mercury - - - - -	180	134323
Rhodium - - - - -	-	108900
Osmium - - - - -	-	-
Iridium - - - - -	-	-
Copper - - - - -	56	88070
Iron - - - - -	50	77101
Lead - - - - -	97	112382
Tin - - - - -	50	72260
Antimony - - - - -	40	66449
Bismuth - - - - -	68	97238
Zinc - - - - -	28	67923
Nickel - - - - -	50	89753
Tellurium - - - - -	-	60538
Cobalt - - - - -	55	76230
Tungsten - - - - -	56	174240
Manganese - - - - -	50	67815
Titanium - - - - -	40	-
Uranium - - - - -	-	89100
Cerium - - - - -	45	-
Columbium - - - - -	-	-
Potassium - - - - -	35	8415
Sodium - - - - -	21	9405
Barium - - - - -	61	-
Strontium - - - - -	39	-
Calcium - - - - -	17	-
Magnesium - - - - -	10	-
Aluminum - - - - -	8	-
Glucinum - - - - -	23	-
Ittrium - - - - -	48	-
Zirconium - - - - -	38	-
Silicium - - - - -	38	-
Hydrogen - - - - -	1	1
Sulphur - - - - -	14	19701
Azote - - - - -	6.5	-
Carbon - - - - -	5.4	-
Boron - - - - -	5.5	-
Phosphorus - - - - -	10	17513
Arsenic - - - - -	40	84249
Molybdenum - - - - -	-	85249
Chromium - - - - -	-	58410
Supporters of Combustion.		
Oxygen - - - - -	7.5	14
Chlorine - - - - -	30	30.75
Iodine - - - - -	-	117
Fluorine - - - - -	-	-

The bodies of the first class, with the exception of sulphur, phosphorus, azote, hydrogen, and carbon, are known to be metals; and there is strong reason to believe that hydrogen is a metal in the elastic form. It is very remarkable, that those bodies, the metallic nature of which is doubtful, appear to possess the property of combining more strongly with inflammable bodies, than the metals with each other in forming alloys. Indeed, the combinations of most of the metals with those that are not metallic, are generally conspicuous, and always definite.

The first of the second class of bodies, *viz.* oxygen, has long been considered a simple body. The second has been lately, by the French chemists and by sir Humphrey Davy, considered in the same light. It was till lately considered as a compound of muriatic acid and oxygen, from which it was called oxymuriatic acid. Its name is now changed to chlorine, from its green colour. Iodine is another substance of the same class, exhibiting striking properties with inflammable bodies. Its name has been derived from the violet colour of its vapour. It was discovered in kelp, a substance which consists of soda combined with certain impurities. The iodine is extracted from it by the following process. Infuse the kelp in hot water till all the soluble part is taken up; then evaporate the solution till the carbonate of soda crystallizes on cooling. In this way, by repeating the evaporation and cooling, separate as much as possible of this salt; then continue the evaporation to dryness. This residuum is now to be introduced into a glass retort, or a long-necked matrass, and a quantity of sulphuric acid poured upon it. This is then applied to, at first, a gentle heat. When the temperature reaches about 300°, a purple or violet-coloured vapour appears in the neck of the retort, which condenses into shining opaque crystals of the appearance of plumbago. These crystals are pure iodine. Iodine, in the solid form, is of a greyish-black colour, its vapour being of a beautiful violet. Its crystals have a shining scaly appearance, like mica. Their form is that of rhomboidal plates, and sometimes of elongated octohedrons. It is soft and friable, so as to rub to powder between the fingers. It stains the skin of a deep brown colour, but not permanently. It has the smell of chlorine or oxymuriatic gas. Its taste is acrid, although it requires seven thousand parts of water for its solution. It destroys vegetable colours, like chlorine, but with less energy.

Its specific character is 4.948 at the common temperature, water being 1. It fuses at 225° of Fahrenheit, and assumes the elastic form at 374° or 356°; but it will come over in distillation with the vapour of water. It is a non-conductor of electricity.

Iodine, like oxygen and chlorine, has the property of supporting combustion with combustible bodies. With some of these it forms compounds analogous to oxyds, and with hydrogen it forms an acid resembling the muriatic acid, the compound formed by hydrogen with chlorine. In these instances, iodine and chlorine have not only the property of supporters of combustion, but of forming acids with an inflammable base. They, however, in their turns, act the part of combustible bodies, by forming acids with oxygen. It appears also, from the views of Gay Lussac, that sulphur has also this double property, for by combining with hydrogen it forms the well-known compound called sulphuretted hydrogen, which possesses the properties of an acid, and is rendered so by acting the part of oxygen with the inflammable base. On the contrary, it forms sulphuric acid with oxygen by itself, acting the part of an inflammable base.

It also appears to this philosopher, that azote, carbon, and phosphorus, may have the power of producing acidity by

SIMPLE BODIES.

by their combining with certain inflammable bases. He is of opinion, that most of the vegetable acids do not owe their acidity to oxygen combined with hydrogen and carbon, but to the carbon acting the part of oxygen with hydrogen, as sulphur, chlorine, and iodine do with the same.

Agreeably to this view, we shall give some of the facts attendant on chlorine, iodine, and sulphur, in their combinations with hydrogen and oxygen.

To the binary combinations of these bodies with others, in which they have no acidity, Gay Lussac has given the names of chlorurets, jodurets, and sulphurets; as chloruret of potassium, joduret of zinc, sulphuret of iron, and so on. When they form acids with hydrogen, they are termed hydrochloric, hydraodic, and hydrosulphuric acids. The acids formed by their combinations with oxygen he terms chloric, jodic, and sulphuric acids. The chloric acid is the same with what has been called the hyperoxymuriatic acid, and forms with potash what has been termed hyperoxymuriate of potash. The jodic acid forms a compound with potash, having similar properties, and affording a large quantity of dispoable oxygen.

The hydrochlorates are the salts which have been called muriates, and have some resemblance to the hydriodates, a set of salts formed by the acid arising from the union of iodine with hydrogen, and the different saline bases.

The hydraodic acid is formed by first combining phosphorus with iodine, in the proportion of one of the former to nine of the latter. This compound being brought in contact with water, affords the hydraodic acid. The water is decomposed, the oxygen of which combines with the phosphorus to form phosphoric acid, and the hydrogen with the iodine, forming the hydraodic acid. If the iodine and phosphorus were 18 of iodine to 1 of phosphorus, then phosphoric acid would be formed in the water. On the other hand, if the iodine were 4.5 to 1 of phosphorus, then hydraodic acid would be formed, and a compound of phosphorus and oxygen, consisting of two atoms of the former to one of the latter. This is the red insoluble substance which has been called oxyd of phosphorus.

In all these processes the hydraodic acid is evolved in fumes smelling like muriatic acid, and may be collected, like it, in the gaseous form. This gas is about 60 times heavier than hydrogen. Water absorbs a large quantity of it, so as to form a very strong acid, of the specific gravity of 1.7. This acid is decomposed in two ways, principally by such bodies as easily separate its hydrogen and set free the iodine, such as the sulphuric and nitric acids, and many of the oxyds, by which water and jodurets are formed. It is also decomposed by the superior attraction of iodine for other bodies, setting the hydrogen free. Such is the case with most of the metals.

The compounds of the hydraodic acid with different saline bases form salts, resembling the hydrochlorates (muriates) and the hydrosulphates. The other binary compounds of iodine, and the different combustible bodies which are called jodurets, are very conspicuous. Most of these are insoluble in water. Those metals which decompose water, form soluble jodurets; as in these instances the joduret becomes an hydriodate.

Another set of compounds results from iodine, which we have already called jodates. Iodine combines with oxygen, in the proportion of 5 atoms of the latter to 1 of the former, which is 117 iodine to $5 \times 7.5 = 37.5$ of oxygen. This constitutes the jodic acid.

This acid cannot be directly formed by combining iodine with oxygen; but it is formed during the action of iodine

upon potash, soda, barytes, strontian, lime, and magnesia, when water is present. The changes are precisely what take place, when chlorine is substituted for iodine. Two salts are formed with the base employed; the one with chloric or jodic acid, and the other with hydrochloric or hydraodic acid.

When iodine in vapour is passed through a solution of potash, four atoms of iodine decompose four atoms of water, by which four atoms of hydraodic acid are produced. These unite with four atoms of potash, forming as many compound atoms of hydriodate of potash. The four atoms of oxygen, separated from the water, now unite with a fifth atom of iodine, and a fifth atom of potash; the whole of which will amount to an atom of joduret of potassium, united to five atoms of oxygen, constituting an atom of jodate of potash. It will appear, therefore, that during the formation of any of the jodates or the chlorates, that for every atom of such jodate or chlorate there will be formed, at the same time, four atoms of an hydriodate or hydrochlorate.

In the example above stated, an atom of jodate of potash will be 1 atom of iodine (117) + 1 atom of potassium (37.5) + 5 atoms of oxygen (5×7.5) = 192. The 4 atoms of hydriodate of potash will consist of 4 atoms of hydraodic acid ($4 \times (117 + 1)$) + 4 atoms of potash ($4 \times (37.5 + 7.5)$) = $472 + 180 = 652$. The ratio, therefore, of the jodate of potash to the hydriodate, will be 192 to 652, or 100 to 340 nearly. In the crystalline form, however, the hydriodate of potash does not crust, but is converted into joduret of potassium, which will consist of an atom of iodine (117) added to an atom of potassium (37.5) = 154.5, and $154.5 \times 4 = 618$, the quantity of the crystallized joduret to the jodate, which will be 100 of the latter to 322 of the former nearly.

It is rather out of place to enter into the particulars of bodies; but this last substance, from its recent discovery, has not been before mentioned in this work. There are also many interesting particulars respecting chlorine; but these are rather new explanations, under the idea of this being a simple body, than new facts.

We know little more of the body called fluorine, than that it is in all probability a body combining with hydrogen to form fluoric acid, in the manner that chlorine and iodine form hydrochloric and hydraodic acids with that body. To the combinations of chlorine with the different bodies, in which no acidity prevails, Dr. Thomson has proposed the name of chlorids, as being more agreeable to the termination in the word oxyds; and we suppose would adopt, for similar combinations of iodine, jodids; and we should expect, from the sulphurates being analogous, that they would be called sulphids, to keep up the same uniformity. The French chemists (see Gay Lussac's Memoir on Iodine, Thomson's Annals, vol. v.) have adopted for the same compounds the termination already used for the sulphurets, viz. chlorurets, jodurets; and for the combinations of carbon and azote with the same bodies, they would use carburets, azoturets, or, what is better, nitrogurets. We see no objection to this termination for all the binary compounds not possessing acidity, as in fact there would be no other change than that of altering oxyd into oxuret. The acids would still retain their terminations, *ous* and *ic*, distinguishing those which do not contain oxygen by the acidifying substance. The salts, as at present, would derive their names from the acids. See NOMENCLATURE.

SIMPLE, in *Botany*, is a general name given to all herbs and plants; as having each its particular virtue, by which it becomes a simple remedy.

The simples from the Levant, and the East Indies, were not known among us till about the year 1200.

SIMPLE Leaves. See **LEAF**.

The term *simple* is also technically applied to some other parts of a plant. A *simple calyx* is used in the *columniferous* order, in opposition to the double one of *Malva*, *Hibiscus*, and many other genera of that order. A *simple stigma* means, that the part in question is of no elaborate or peculiar shape, or structure, but merely adequate to perform its requisite functions. This end is sufficiently answered by a rather obtuse, though not dilated, figure, just enough to receive the pollen upon a moist surface, or point. If a stigma be acute, or taper-pointed, that character should be specified; as also if it be capitate, concave, lobed, fringed, &c.; in all which latter cases it is no longer *simple*. See **STIGMA**, and **FECUNDATION of Plants**.

A *simple stem*, or *stalk*, is destitute of branches, or subdivisions. Such also is *simple pubescence*, the hairs of which are unbranched and straight; not stellated, entangled, or hooked.

SIMPLE, in French *Musique*, in an air with variations, implies the air itself, in opposition to the *doubles* or variations. See **AIR**, and **DOUBLE**.

SIMPLE Cadence, is that where the notes are all equal through all the parts.

SIMPLE Concordes, are those in which we hear at least two notes in consonance; as a third and a fifth; and, of consequence, at least three parts. This is either done immediately, and is called the *harmonical triad*, or in a more remote manner, that is, when the sounds, that are not bass, are one or two octaves higher. This distance has no ill effect in the third, but in the fifth it has; and, generally speaking, the nearer, or more immediate, the concords are, the better. See **CONCORD**.

They also say **C simple**, or plain, in opposition to **C accented**.

SIMPLE Counterpoint, *Fugue*, *Interval*, *Sounds*, and *Triple*. See the substantives.

SIMPLE Equation, *Fraction*, and *Surd*, in *Algebra*. See the substantives.

SIMPLE Quantities, are those which consist of one term only; as $+a$, $-ab$, or $+abc$; accordingly they are opposed to compound quantities.

SIMPLE Glands, in *Anatomy*. See **GLANDS**.

SIMPLE Anomaly and *Excentricity*, in *Astronomy*. See the substantives.

SIMPLE Form, *Modes*, *Necessity*, *Opposition*, and *Proposition*, in *Logic* and *Metaphysics*. See the substantives.

SIMPLE Average, *Benefice*, *Church*, *Deposit*, *Estate*, *Fee*, *Force*, *Larceny*, *Resignation*, and *Vassalage*. See the substantives.

SIMPLE Contracts, *Debits* by, are such, where the contract upon which the obligation arises is neither ascertained by matter of record, nor yet by deed or special instrument, but by mere oral evidence, or by notes unsealed, which are capable of a more easy proof, and (therefore only) better than a verbal promise.

SIMPLE Diachylon, *Diacodium*, *Diamorum*, *Diaprunum*, *Dropax*, *Fomentations*, *Hydromel*, *Mixture*, *Oxymel*, and *Waters*. See the substantives.

SIMPLE Fencing. See **FENCING**.

SIMPLE Flank and *Tenaille*, in *Fortification*. See the substantives.

In *Geometry*, we say, the most simple demonstrations are the best.

In *Grammar*, we have simple words, or primitives; and compounds, which have some particle added to them.

In *Jurisprudence*, they say a simple donation, in opposition to a mutual or reciprocal one: a simple sale, in opposition to that made with a reservation of the faculty of redemption; and simple homage, in opposition to liege homage.

SIMPLE Fossils, in *Natural History*. See **FOSSILS**.

SIMPLE Machine, *Motion*, *Pendulum*, and *Wheel*, in *Mechanics*. See the substantives.

The simplest machines are always the most esteemed.

SIMPLE Vision, in *Optics*. See **VISION**.

In *Pharmacy*, there are simple remedies, and compounds; the former of which are usually preferable to the latter.

SIMPLE Taste, in *Physiology*. See **TASTE**.

SIMPLE History and *Style*, in *Rhetoric*. See the substantives.

SIMPLE Fracture and *Ulcer*, in *Surgery*. See the substantives.

SIMPLER'S JOY, in *Botany*. See **VERBENA**.

SIMPLEX OCLUS, in *Surgery*, the name of a bandage for the eye.

SIMPLICITY, in *Ethics*. See **SINCERITY**.

SIMPLICITY, in *Musique*. There is much cant about simplicity in music, among the exclusive admirers of old things, and lamentation for the loss of our old melodies to the songs of Chaucer, Gower, Lydgate, and others, of which the words are still extant. But if we may judge by what has escaped the ravages of time, of a later date, the loss of our musical compositions of this period may be supported without much affliction. We may perhaps heighten that affliction considerably by censuring modern refinements, and extolling the charms of ancient simplicity; but simplicity in melody, beyond a certain limit, is unworthy of the name that is bestowed upon it, and encroaches so much upon the rude and savage boundaries of uncouthness and rusticity, as to be wholly separated from proportion and grace, which should alone characterise what is truly simple in all the arts: for though they may be ennobled by the concealment of labour and pedantry, they are always degraded by an alliance with coarse and barbarous nature.

Old melodies, when we find them, and can ascertain their dates, are curious historical facts in the annals of the musical art; and afford us more satisfactory information concerning our ancient national taste, than all the verbal descriptions in prose and verse can do. And it must be owned, that though the natives of Scotland, Ireland, and Wales, can boast of national tunes, both plaintive and spirited, that are characteristic, pleasing, and distinct from each other, the English have not a melody which they can call their own, except the hornpipe and Cheshire-round. The hornpipe, indeed, was in all probability British, or Welsh; as the pip-corn, or pipe of Cornwall, was an *armoric* instrument and tune, brought thither by the Britons, driven to that part of the island, and into Brittany and Wales, by the Saxons. The Cheshire-round is a melody of the same kind. See **HORNIPIE**, and plate of *National Tunes*.

SIMPLICIUS, *Pope*, in *Biography*, a native of Tivoli, was elected to the pontificate in September 467, on the death of Hilary. During the time of his possessing the see of Rome, great commotions existed in the eastern and western empire. The latter terminated in the person of Augustulus, who was dethroned by Odoacer, king of the Heruli, an Arian. In the East the emperor Zeno was dethroned by Basiliscus, who declared against the council of Chalcedon. Simplicius does not appear to have been personally molested in these changes, but he was frequently called upon to exert himself in defence of the claims of his see, and of the orthodox faith. He moreover extended and strengthened

strengthened the papal jurisdiction over the western church, by appointing the bishop of Seville apostolic vicar in the province of Bœtica, and by an attack upon the metropolitan rights of the bishop of Ravenna, together with other vigorous measures. Simplicius died in the year 483, after having filled the papal chair nearly fifteen years and a half. There are extant eighteen of his letters, chiefly relating to matters of discipline, and the affairs of the eastern churches.

SIMPLICIUS, a Greek philosopher of the sixth century, was a native of Cilicia. He was a disciple of Ammonius the Peripatetic, and Damascius the Stoic; but in his own mode of philosophizing, he endeavoured to unite the Platonic and Stoical doctrines with those established by Aristotle. Of this combination of heterogeneous tenets, his "Commentary upon the Enchiridion of Epictetus" is said to be a good example. Of this work, Fabricius affirms there is nothing in pagan antiquity better calculated to form the morals, or afford juster views of divine providence. Simplicius wrote commentaries upon Aristotle. He was one of the philosophers who took refuge with Chosroes, king of Persia, from an apprehended persecution by Justinian; but they returned to Athens, upon a truce between the Romans and Persians in 549, having stipulated for a toleration. His commentaries upon Aristotle have been several times published in Greek. Those on Epictetus were published in Greek and Latin, with the notes of Wolfius and Salmasius. They have been translated into the English and French languages.

SIMPLIFYING, in *Ecclesiastical Matters*, is the taking away of a cure of souls from a benefice, and dispensing the beneficiary from residence.

Several benefices, which have been simplified, now require residence; and many others, which required residence, have been simplified.

Some use the word in a more extensive signification, *viz.* for the shortening a relation, &c. or retrenching every thing not precisely necessary. When the matter of fact shall be simplified, and stripped of its vain circumstances, the court will see, &c.

SIMPLOCE, in *Rhetoric*, a figure which comprehends both the anaphora and epistrophe. In this figure the several members begin and end with the same word. Thus St. Paul: *Are they Hebrews? So am I. Are they Israelites? So am I. Are they the seed of Abraham? So am I.* 2 Cor. xi. 22.

SIMPLON, in *Geography*, a mountain of Switzerland, over which is a passage from the Valais to the duchy of Milan; 6597 feet above the level of the sea; 31 miles E. of Sion.

SIMPLUDIARIA, in *Antiquity*, a kind of funeral honours paid to the deceased at their obsequies.

The word is formed from the Latin *simplex*, and *ludus*; whence *simpludiaria*, or *simpliludaria*, *q. d.* *simple games*. Some will have simpludiaria to be the funerals at which games were exhibited: such is the sentiment of Paulus Diaconus. Festus says, they were those, in the games of which nothing was seen but dancers and leapers, called *corvitores*; who, according to M. Dacier, were persons who run along the masts and yards of vessels or boats, called *corbes*.

In other respects, those two authors agree as to the kind of funerals called simpludiaria; *viz.* that they were opposite to those called *indistincta*; in which, besides the dancers and leapers observed in the simpludiaria, there were defultores, or people who vaulted on horses; or perhaps horse-races, in which the cavaliers leaped from horse to horse at full speed.

SIMPSON, THOMAS, in *Biography*, a celebrated self-taught mathematician, was born at Market Bosworth, in Leicestershire, in 1710. His father, who was a weaver in that town, intended to bring him up to his own trade, and took little heed of his education. Nature, however, had endowed him with fine talents, and an ardour of disposition, which excited him to nobler pursuits. At an early period he gave indications of his turn for study, by eagerly perusing every book that fell in his way, and omitting no opportunity to acquire instructions from others. His father, finding that he was thus led to neglect his work, endeavoured to restrain him from what he regarded as idle pursuits; but after some fruitless attempts, a difference was produced between them, which at length terminated in an open rupture, and Thomas left his father's house, and married the widow of a taylor, with whom he resided at Nuneaton, where he continued some time working at his trade, and improving his knowledge. Here he became acquainted with a travelling pedlar, who lodged in the same house, and who, to the profession of an itinerant merchant, had united the more profitable one of a fortune-teller. An intimacy was formed between them, and as the pedlar was going to Bristol, he lent, during his absence, Cocker's Arithmetic to Simpson, to which was subjoined a short appendix on Algebra; and a book on Genitures, by Partridge, the almanac-maker. These books he studied so closely, that on the pedlar's return, he was astonished to find that Simpson was little inferior to himself in the art of calculating nativities; and he predicted that he would shortly be his superior. Encouraged by this prophecy, he at first determined to embark in the trade of a fortune-teller; and by this occupation, and teaching a school, he found means to support himself without weaving, which he now entirely abandoned, and was soon regarded as the oracle of the neighbourhood. From this time he seems to have lived very comfortably, till an unfortunate event involved him in a deal of trouble. Having undertaken to raise the devil, in order to answer certain questions to a young woman, who consulted him respecting her sweetheart, then absent at sea, the credulous girl was so frightened on the appearance of a man from beneath some straw, who represented the devil, that she fell into violent fits, from which she was with difficulty recovered, and which for a considerable time threatened insanity or fatuity. In consequence of this exertion of his art, he was obliged to leave the place, and he removed to Derby, where he remained a few years, working at his trade by day, and instructing pupils in the evening. He became a writer in the Lady's Diary in the year 1736: his first questions were stated in verse, and are of that kind as shew that at this period he had made some progress in mathematical knowledge. He from this period applied himself with great ardour to every branch of the analytic science, and acquired a deep insight into the doctrine of fluxions, upon which he afterwards published a work, which is even now regarded as among the best, if not the very best, existing in our language. After he had given up astrology, and its emoluments, he found himself reduced to great straits, notwithstanding his industry to provide a subsistence for his family at Derby; and on that account he determined to remove to London, which he did in the year 1736. When he arrived at the capital, unknown and without recommendation, he for some time followed his business in Spitalfields, and taught mathematics in the evening, and at other spare hours. His exertions were attended with such success, that he returned to the country, and brought to town his wife, with her three children. The number of his scholars increased, and he was encouraged to make proposals for publishing by subscription

subscription "A New Treatise of Fluxions." The book was printed in 1737. In the year 1740 he published "A Treatise on the Nature and Laws of Chance." This is a very thin and small quarto; and to this treatise are annexed full and clear investigations of two important problems, added to the second edition of De Moivre's Book of Chances, as also two new methods for the summation of series. Mr. Simpson's next publication was a volume, in quarto, of "Essays on several curious and interesting Subjects in speculative and mixed Mathematics," printed in 1740. Soon after the publication of this book, he was chosen member of the Royal Academy at Stockholm. This was followed by a smaller volume, on "The Doctrine of Annuities and Reversions, deduced from general and evident Principles, with useful Tables, shewing the Values of single and joint Lives." Next year came out an "Appendix, containing Remarks on De Moivre's Book on the same Subject, with Answers to some personal and malignant Representations in the Preface to it." In 1743 he published his "Mathematical Dissertations on a variety of physical and analytical Subjects." Shortly after this he published "A Treatise on Algebra," which in the year 1755 he enlarged and considerably improved. After this he gave the public his "Elements of Geometry," with their application to mensuration, to the determination of maxima and minima, and to the construction of a great variety of geometrical problems. This work has passed through many editions, and is still read in some places devoted to the education of the young; though we think it has been superseded by other treatises of more modern date. The first edition of this book occasioned some controversy between Mr. Thomas Simpson and Dr. Robert Simson, the author of a well-known edition of Euclid's Elements. See SIMSON.

In the year 1748, Mr. Simpson published "Trigonometry, plane and spherical, with the Construction and Application of Logarithms." In 1750 he published a new edition of his "Treatise on Fluxions," which, however, he wished to be considered rather as a new work than a new edition of an old one. In 1752 appeared in 8vo. a work, entitled "Select Exercises for young Proficients in Mathematics;" and in 1757 he published his last work, entitled "Miscellaneous Tracts,"—"which," says Dr. Hutton, "was a valuable bequest, whether we consider the dignity and importance of the subjects, or the sublime and accurate manner in which they are treated." Such are the scientific works of Mr. Simpson. Through the interest of Mr. Jones, the father of the celebrated Sir William Jones, Mr. Simpson was, in 1743, appointed to the professorship of mathematics, then vacant, in the Royal Academy of Woolwich; and in 1745 he was admitted a fellow of the Royal Society. On this occasion, in consequence of his very moderate circumstances, he was excused his admission fees, and from giving bond for the settled future annual payments. As a professor, he exerted all his talents in instructing the pupils committed to his care. He had, it has been said, a peculiar and happy method of teaching, which, united to a great degree of mildness, engaged the attention, and conciliated the esteem and friendship of his scholars. Mr. Simpson died in the year 1761, in the 51st year of his age. Besides the works already mentioned, he wrote several papers, which were read before the Royal Society, and printed in their Transactions. He was not only a contributor to, but for some years editor of, the Lady's Diary, during which, viz. from the year 1754 to 1760, he raised that work to a high degree of respectability. In 1760, when a plan was in agitation for erecting Blackfriars bridge, he was consulted

by the committee in regard to the best form for the arches. On this occasion he preferred the semicircular form; and besides his report to the committee, he wrote some letters on the subject, which were afterwards published in the Gentleman's Magazine.

SIMPSON, JOHN, was born at Leicester, in the month of March 1746. He was educated for the ministry among the Protestant dissenters, under the care of Mr. (afterwards Dr.) John Aikin, who kept a flourishing school at Kibworth, in Leicestershire, and afterwards an academy at Warrington, for the education of young men devoted to the ministry. From Warrington Mr. Simpson went, in 1765, to Glasgow, where he spent two years in this ancient seat of learning, and where he attended the lectures of the excellent Dr. Leechman. At Glasgow he remained two years, when he pursued his studies in a private manner among his relations, till the month of April 1772, when he settled at Nottingham, and from thence removed, in 1777, to Walthamstow, where he became pastor of the congregation of dissenters, which had previously enjoyed the joint services of Mr. Farmer and Mr. Radcliffe. Here he remained but two years, and after this it does not appear that he was settled any where as minister, but continued preaching occasionally to the end of his life. As a preacher he acquired considerable reputation, but he is chiefly known as a critic on the Holy Scriptures. His principal work is entitled "Essays on the Language of Scripture," in two volumes octavo. Besides this he published many other works, among which are "An Essay to shew that Christianity is best conveyed in the Historic Form;" "A View of the internal and presumptive Evidences of Christianity," which is a most useful performance, and it has been said may be ranked, in merit and value, with the moral demonstrations of the truth of the Christian religion of Taylor, Locke, Lardner, Clarke, and Paley. Mr. Simpson died in the year 1813. He was an Unitarian in the largest sense of the word; and agreeably to the enlightened, conscientious, and general consistency of his character, his speculative belief inspired him with the most genuine sentiments of rational piety, and an elevated devotion. He was firm in his principles, steady in his conduct, and courteous in his manners; modest, humble, affectionate, disinterested, and generous. See Sermons on the Death of Mr. Simpson, by the Rev. T. Jervis and the Rev. — Hunter.

SIMPSON, CHRISTOPHER, an English musician of the seventeenth century, extremely admired for his performance on the viol da gamba, or six-stringed-bass, and general knowledge of music. The bass-viol with six strings, and a fretted finger-board, was in such general favour in his time, that almost all the first musicians of our country, whose names are come down to us, were performers upon it, and composed pieces purposely to shew its powers; but particularly Coperario, William Lawes, Jenkins, Dr. Colman, Lupo, Mico, and Loofemore.

Simpson, during the last years of the Usurpation, published a treatise on this instrument, entitled "The Division Violist, or an Introduction to the playing upon a Ground." But this instrument, like the lute, without which no concert could subsist, was soon after so totally banished, that its form and construction were scarcely known, till the arrival of Abel in England, whose taste, knowledge, and expression upon it were so exquisite, that, instead of renovating its use, they seem to have kept lovers of music at an awful distance from the instrument, and in utter despair of ever approaching such excellence. The instrument itself, however, was so nasal, that this great musician, with all his science and power of hand, could not prevent his most enthusiastic

thusiastic admirers from lamenting that he had not, early in life, applied himself to the violoncello.

But if its general use had continued, or were restored, this book of Simpson, from the universal change of taste and style of every species of music, would be of but little use to a student on that instrument now; when rapid divisions, of no other merit than the difficulty of executing them, have been totally supplanted by vocal expression, learned modulation, and that rich harmony to which the number of its strings is favourable. Rough, but warm encomiastic verses, are prefixed to Simpson's works by Dr. Colman, John Jenkins, Mathew Lock, and others, which only shew with what perishable materials musical fame is built!

A translation of this book into Latin, for the use of foreigners, with the original text on the opposite page, was published by the author in 1665, under the title of "*Chelys Minuritionum*; Editio secunda," thin folio.

Besides these, Simpson published, in 1667, "*A Compendium of practical Music, in five Parts, containing* 1. The Rudiments of Song. 2. The Principles of Composition. 3. The Use of Discord. 4. The Form of Figurative Decant. 5. The Contrivance of Canon."

Whoever expects to learn the whole principles of an art by a single book, or, indeed, any number of books, without oral instruction, or great study, practice, and experience, must be disappointed. This compendium, like most others of the kind, more frequently generates new doubts and perplexities, than removes the old. However, something is to be learned from most books; and what a student is unable to find in one, if out of the reach of a master, must be sought in another.

Simpson, in his younger days, served in the royal army, raised for Charles I. by Cavendish, duke of Newcastle; he was a Roman Catholic, and patronized by sir Robert Bolles, of Leicester-Place, with whom he resided during the Interregnum. He seems to have been in close friendship with Jenkins and Lock, as, on all occasions, they reciprocally praise each other.

SIMPSON, REDMOND, an eminent performer on the hautbois. He was a natural son of Dubourg, the famous performer on the violin, and served an apprenticeship to Low, the hautbois player and copyist. Simpson, when out of his time, improved in the performance on his instrument so much, as to be thought, till the arrival of Fischer, superior to all the hautbois players of his time, except T. Vincent, the disciple of Martini. On the death of Richard Vincent, in 1777, first hautbois, during more than thirty years, of Covent Garden playhouse, and of Vauxhall gardens, father of the first husband of Miss Burchell, Simpson was engaged as first hautbois at Covent Garden, and in a few years rendered himself so useful in bringing out musical performances at that theatre, that he was appointed joint manager; and was an active and important personage at the meetings of the musical fund; was one of the assistant directors at the commemoration of Handel, in 1784; had a turn for business; and after ceasing to play in public, he was often useful in stating, calculating, and settling the accounts of the society, to the time of his death, in January 1787. He was buried in the cloister of Westminster Abbey, his funeral being attended by the principal professors in London.

SIMPSON, in *Agriculture*, a provincial term applied to groundsel, a troublesome weed in some soils.

SIMPSON'S *Island*, in *Geography*, a small island in the South Pacific ocean, discovered by captain Carteret in 1767; 4 miles W. from Carteret island. S. lat. 8° 26'. E. long. 159° 20'.

SIMPULUM, among the Romans, a vessel with a long handle, and made like a cruet. It was used in sacrifices and libations, for taking a very little wine at a time.

SIMRAR, in *Geography*, a town of Hindoostan, in Oude; 24 miles E.S.E. of Fyzabad.

SIMREE, a town of Bengal; 32 miles N.N.W. of Boglipoor.

SIMSAT, a town of Asiatic Turkey, in the government of Diarbekir; 54 miles W. of Diarbekir.

SIMSBURY, a post-town of America, in Hartford county, Connecticut; 14 miles N.W. of Hartford. Copper-ore has been found in this place. It contains 1966 inhabitants; 386 miles from Washington.

SIMSIA, in *Botany*, so called by Mr. Brown, is a just tribute to the botanical learning and skill of Dr. John Sims, F.R.S. and F.L.S. the continuator, since the fourteenth volume, of the popular and very useful *Botanical Magazine*, of the late Mr. WILLIAM CURTIS; see that article.—Brown Tr. of Linn. Soc. v. 10. 152. Prodr. Nov. Holl. v. 1. 367.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceae*, Juss. Brown.

Gen. Ch. *Cal.* none, unless the corolla be taken for such. *Cor.* Petals four, inferior, linear-oblong, equal, deciduous; reflexed at the extremity. Nectary none. *Stam.* Filaments four, awl-shaped, prominent, inserted into the disk of each petal; anthers roundish, cohering, so that the adjoining lobes of each make one common cell, at length separating. *Pist.* Germen superior, obovate; style cylindrical; stigma dilated, concave. *Peric.* Nut inversely conical, of one cell, naked.

Eff. Ch. Petals four, equal, reflexed, without nectiferous glands. Stamens prominent. Anthers cohering, their adjoining lobes making a common cell. Stigma dilated, concave. Nut inversely conical.

A New Holland genus of smooth shrubs, of humble growth. *Leaves* alternate, thread-shaped, forked; their footstalks dilated at the base. *Flowers* small, yellow, smooth, composing small, globose, terminal heads, disposed either in clusters or panicles, with or without a short common *involucrum*, and with a minute *bractea* under each flower. Two species only are mentioned.

1. *S. tenuifolia*. Slender-leaved Simsia.—Heads naked, mostly solitary on each branch of the panicle, accompanied by small partial bracteas.—Found by Mr. Brown, on stony sides of hills, in Lewin's land, on the south coast of New Holland.

2. *S. anethifolia*. Fennel-leaved Simsia.—Heads numerous in each panicle, and about as long as its partial branches, accompanied by imbricated involucreal leaves.—Gathered by Mr. Brown, on the sandy sea-shores of the same country.

SIMSKALA, *Oster and Wester*, in *Geography*, two small islands in the Baltic, E. of Aland, about four miles apart. N. lat. 60° 21'. E. long. 20° 8'.

SIMSON, ROBERT, in *Biography*, was born in the year 1687, of a very respectable family, in the county of Lanark. He was educated in the university of Glasgow, where he made great progress in his studies, and acquired in every branch of science a large stock of information, which, if it had never been greatly augmented afterwards, would have done great credit to any professional man. He became, at an early period, an adept in what was denominated the philosophy and theology of the schools, and was able to supply with great credit the place of a sick relation in the class of Oriental languages. While he was pursuing a course of the theology, as preparatory to his entering into orders, mathematics took hold of his fancy, and he would, in after-life, say

say that he amused himself in his favourite pursuit, while he was actually preparing his exercises for the divinity hall. When fatigued with speculations, in which he could not meet with certainty to reward his labours, he relieved his mind, ardent in the pursuit of truth, by turning to mathematics, with which he never failed to meet with what would satisfy and refresh him. For a long time he restricted himself to a very moderate use of the cordial, fearing that he should soon exhaust the stock which so limited and abstract a science was capable of yielding; at length, however, his fears were dissipated on this head, for he found that the more he learned, and the farther he advanced, the more there was to learn, and a still wider field opened to his view. He accordingly determined to make the mathematics the profession of his life, and gave himself up to the study without reserve. It is said, that his original incitement to this science as a treat, as something to please and refresh the mind in the midst of severer tasks, gave a particular turn to his mathematical pursuits, from which he could never deviate. He devoted himself chiefly to the ancient method of pure geometry, and felt a decided dislike to the Cartesian method of substituting symbols for the operations of the mind, and still less was he willing to admit symbols for the objects of discussion, for lines, surfaces, solids, and their affections. He was rather disposed in the solution of an algebraical problem, where quantity alone is to be considered, to substitute figure and its affections for the algebraical symbols, and to convert the algebraic formula into an analogous geometrical theorem. In so little respect did he come at last to consider algebraic analysis, as to denominate it a mere mechanical knack, in which he would say we proceed without ideas of any kind, and retain a result without meaning, and therefore without any conviction of its truth.

About the age of twenty-five Dr. Simson was chosen professor of mathematics in the university of Glasgow. He immediately went to London, and there formed an acquaintance with the most eminent men who at that time flourished in the metropolis. Among these was the celebrated Halley, of whom he always spoke with the most marked respect, saying that he had more acute penetration, and the most just taste in that science, of any man he had ever known. Dr. Simson also admired the masterly steps which sir Isaac Newton was accustomed to take in his investigations, and his manner of substituting geometrical figures for the quantities which are observed in the phenomena of nature. He was accustomed to say, that the 39th proposition of the first book of the *Principia*, was the most important proposition that had ever been exhibited to the physico-mathematical philosopher, and he used to illustrate to the higher classes of his pupils, the superiority of the geometrical over the algebraic analysis, by comparing the solution given by Newton, of the inverse problem of centripetal forces, in the 42d proposition of that book, with the one given by John Bernoulli, in the *Memoirs* of the Academy of Sciences at Paris, for the year 1713.

Returning to his mathematical chair, Dr. Simson discharged the duties of a professor, for more than half a century, with great honour to the university and to himself. It is scarcely necessary to add, that in his lectures he always made use of the geometry of Euclid, in preference to those works which he thought leaned too much to analysis. His method of teaching was simple and perspicuous, his elocution clear, and his manner easy and impressive. He uniformly engaged the respect and affection of his pupils.

It was owing to the advice of Dr. Halley that our author so early directed his efforts to the restoration of the ancient geometers. He had recommended this to him as the most

certain means of acquiring a high reputation, as well as to improve his taste, and he presented him with a copy of Pappus's *Mathematical Collections*, enriched with his own notes. The perspicuity of the ancient geometrical analysis, and the elegance of the solutions which it affords, induced him to engage in an arduous attempt, which was nothing less than the entire recovery of this method. His first task was the restoration of Euclid's *Porisms*, from the scanty and mutilated account of that work in a single passage of Pappus. He, however, succeeded, and so early as 1718, seems to have been in possession of this method of investigation, which was considered by the eminent geometers of antiquity as their surest guide through the intricate labyrinths of the higher geometry. In 1723 Dr. Simson gave a specimen of this discovery in the *Philosophical Transactions*; and after that period he continued with unremitting assiduity to restore those choice *porisms* which Euclid had collected, as of the most general use in the solution of difficult problems. Having obtained the object of which he was in pursuit, he turned his thoughts to other works of the ancient geometers, and the *Porisms* of Euclid had now only an occasional share of his attention. The *Loci Plani* of Apollonius were the next task in which he engaged, and which he completed in the year 1738; but after it was printed he was far from being satisfied that he had given the identical propositions of that ancient geometer; he withheld the impression several years, and it was with extreme reluctance that he yielded to the entreaties of his mathematical friends in publishing the work in 1746, with some emendations, in those cases in which he thought he had deviated the most from the author. Anxious for his own reputation, and fearing that he had not done justice to Apollonius, he soon recalled all the copies that were in the hands of the booksellers, and the impression lay by him several years. He afterwards revised and corrected the work, and even then did not, without some degree of hesitation, allow it to come into the world as the restoration of Apollonius. The work was, however, received by the public with great approbation; the author's name became better known; and he was now considered as among the very first and most elegant geometers of the age. He had, previously to this, published his *Conic Sections*, a treatise of uncommon merit, whether considered as a complete restitution of the celebrated work of Apollonius Pergæus, or as an excellent system of this useful branch of mathematics. This work was intended as an introduction, or preparatory piece, to the study of Apollonius, and he has accordingly accommodated it to this purpose. The intimate acquaintance which Dr. Simson had now acquired with all the original works of the ancient geometers, as well as with their commentators and critics, encouraged him to hope that he should be able to restore to its original state that most useful of them all, the *Elements* of Euclid, and under the impression of this idea, he began seriously to make preparation for a new and more perfect edition. The errors which had crept into this celebrated work appeared to require the most careful efforts for their extirpation; and the data also, which were in like manner the introduction to the whole art of geometrical investigation, seemed to call for the noblest exertions of a real master in the science. The data of Euclid have fortunately been preserved, but the work was neglected, and the few ancient copies, which amount only to three or four, are said to be wretchedly mutilated and erroneous. It had, however, been restored, with some degree of success, by previous authors; but Dr. Simson's view of the whole analytical system pointed out to him many parts which still required amendment. He therefore made its restitution a joint task with that of the *Elements*, and all

lovers

lovers of geometry are ready gratefully to acknowledge their obligations to him for his edition, which contains the *Elements* and the *Data*, and which has gone through many impressions in quarto and octavo, in the Latin and English languages.

Another work on which Dr. Simson bestowed great labour and pains, was the *Sectio Determinata* of Apollonius, which, though begun early, was not given to the world till after his death, when it was printed with the work on *Porisms* of Euclid, at the expence of the late earl Stanhope, who was himself deeply read in mathematics, and who for many years had kept up a constant correspondence with Dr. Simson; and at the death of the professor, in 1768, the noble lord engaged Mr. Clow, professor of logic in the university of Glasgow, to whose care he had left all his papers, to make a selection of such as might serve to support and extend his well-earned reputation as the restorer of ancient geometry.

"The life of a literary man," says his biographer, "feldom marked with much variety; and a mathematician immersed in study, is more abstracted, perhaps, than any other person from the ordinary occurrences of life, and even the ordinary topics of conversation. Such was the case with Dr. Simson. As he never entered into the marriage state, and had no occasion for the commodious house in the university, to which as professor he was entitled, he contented himself with chambers, spacious enough for his own accommodation, and for containing his large, but well-selected, collection of books, but without any decoration, or even convenient furniture. His official servant acted as valet, footman, and bed-maker; and as this retirement was entirely devoted to study, he entertained no company at his chambers, but on occasions, when he wished to see his friends, he repaired to a neighbouring house, where an apartment was kept sacred to him and his guests. He enjoyed a long course of uninterrupted health, but towards the close of life he suffered from acute disease, which obliged him to employ an assistant in his professional labours. He died in 1768, at the age of 81, leaving to the university his valuable library, which is now kept apart from the rest of the books. It is still regarded as the most complete collection of mathematical works and manuscripts in the kingdom, many of them being rendered doubly valuable by the addition of Dr. Simson's notes. It is open for the public benefit, but the use of it is limited by particular rules and restrictions. Dr. Simson was of a good stature, and he had a fine countenance, and even in his old age he retained much gracefulness and dignity of manner. He was naturally disposed to cheerfulness; and though he seldom made the first advances towards acquaintance, he always behaved with great affability to strangers." See Dr. William Trail's *Account of the Life and Writings of Dr. Simson*.

SIMULACRUM, among the Romans. See **IDOL** and **IDOLATRY**.

SIMULATION, in *Ethics*, is making a thing appear which does not exist; and thus it is distinguished from *dissimulation*, which is keeping that which exists from appearing. See **DISSIMULATION**.

SIMULCANDY, in *Geography*, a town of Bengal; 60 miles N.E. of Pucculoe.

SIMULYA, a town of Bengal; 25 miles N.N.E. of Dacca.

SIMUS, in *Ichthyology*, the name used by some authors for the nase, or nase, a fish common in the large rivers in Germany, and somewhat resembling our chub, and in some respects our common rudd.

SIMYRA, **SUMRAH**, in *Ancient Geography*, a town of

Syria, situated on a plain two leagues N. of mount Libanus, and eight leagues S.S.E. of Antaradus, and $1\frac{1}{2}$ league S. of the river Ker. Strabo says that it was inhabited by the Zemarites. Ptolemy places it between the mouth of the rivers Eleutherus and Orthosia.

SIN, the kingdoms of Laos and Camboja, an extensive country of India, on the other side of the Ganges, according to Ptolemy.

SIN, or *Zin*, a city and desert S. of the Holy Land, in Arabia Petraea: this gave name to the wilderness of Sin. The scripture distinguishes two cities and two deserts of Sin; one is written סִן , *Sin*, with a samech, and the other סִינ , *tsin*, with a tzade. The first was near Egypt and the Red sea. The Israelites, in their march, entered the wilderness of Sin immediately after they had passed the sea, between Elin and Sinai. (Exod. xvi. 1. and xvii. 1.) Here the manna descended upon them. The other Sin was south of Palestine, but towards the Dead sea. Kadesh was in the desert of Zin (Deut. xxii. 51.); from this wilderness they sent out the spies. Here Moses and Aaron offended the Lord, at the waters of strife. (Numb. xiii. 21.) The land of Canaan, and the tribe of Judah, had the desert of Zin, or Zina, for their southern limit. Numb. xxvii. 14. xxxiv. 3. Josh. xv. 3.

SIN, in *Theology*, denotes want of conformity to the law of God, given as a rule to the reasonable creature, and so far as any creature is capable of conforming to it, in the things which that law requires, or the transgression of that law in those things which it forbids; and under this definition are comprehended both the sins of *omission* and sins of *commission*.

Plato defines sin to be something void, both of number and measure: by way of contradiction to virtue, which he makes to consist in musical numbers, &c. See **VIRTUE**, and **RHYTHMUS**.

Accordingly, Suarez observes, that an action becomes sinful, by its wanting a due commensuration; for as every thing measured refers to some rule, from which, if it deviate, it becomes incommensurate; and as the rule of man's will is the law of God, so, &c. Suarez adds, that all evil actions are prohibited by some divine law; and that this is required to the perfection of the divine providence.

Simplicius, and after him the schoolmen, assert, that evil is not any positive thing, contrary to good; but a mere defect and accident.

Sins are distinguished into *original* and *actual*.

SIN, *Original*, has been divided by some divines into *inherent* and *imputed*: the former term is used to denote that corruption or degeneracy of nature, which is said to be propagated by the laws of generation from the first man to all his offspring, by reason of which man is utterly indispensed, disabled, and made opposite unto all that is spiritually good, and wholly inclined to all evil, and that continually. Hence, it is said, proceed all actual transgressions. The general cause and ground of this propagation of a sinful nature, are referred originally to man's common interest in the guilt or condemnation of Adam's first sin; but the manner in which this hereditary corruption is conveyed, is not particularly explained, though some have supposed that it may result from the constitution of the body, and the dependence of the mind upon it.

Father Malebranche accounts for it from natural causes thus: men at this day retain, in the brain, all the traces and impressions of their first parents. For all animals produce their like, and with like traces in the brain; whence it is that animals of the same kind have the same sympathies and antipathies, and do the same things on the same

occasions; and our first parents, after their transgression, received such deep traces in the brain, by the impression of sensible objects, that it was very possible they might communicate them to their children.

Now, as it is necessary, according to the order established by nature, that the thoughts of the soul be conformable to the traces in the brain; it may be said, that as soon as we are formed in the womb, we are infected with the corruption of our parents: for having traces in the brain like those of the persons who gave us being, it is necessary we have the same thoughts, and the same inclinations, with regard to sensible objects. Thus, of course, we must be born with concupiscence and original sin. With concupiscence, if that be nothing but the natural effort the traces of the brain make on the mind to attach it to sensible things; and with original sin, if that be nothing but the prevalence of concupiscence; nothing, in reality, but these effects considered as victorious, and as masters of the mind and heart of the child.

Imputed original sin denotes that guilt or obligation to punishment, to which all the posterity of Adam are subject, by the imputation of his transgression. This is called the guilt of Adam's first sin, in which the sinfulness of that state into which man fell is said partly to consist; and it is denominated *original sin*, in order to distinguish it from *actual sin*, or personal guilt. This doctrine of imputed guilt has been explained and vindicated by supposing a covenant made with Adam, (called by divines the "covenant of works," see COVENANT,) as a public person, not for himself only, but for his posterity, in consequence of which he became the federal head, surety, or representative of all mankind; and they descending from him by ordinary generation, sinned in him, and fell with him, in his first transgression. It has been debated, how far the imputation of Adam's sin reaches: some have maintained, that it extends to final condemnation, and eternal misery: others have suggested, that the sin of Adam has subjected his posterity to an utter extinction of being; so that all, who die in their infancy, fall into a state of annihilation, excepting those who are the seed of God's people, who, by virtue of the blessings of the covenant made with Abraham, and the promise to the seed of the righteous, shall, through the grace and power of Christ, obtain a part in a happy resurrection, in which other infants shall have no share.

It seems best to acknowledge, says Dr. Doddridge, that we know nothing certain concerning the state of infants, and therefore can assert nothing positively; but that they are in the hands of a merciful God, who, as he cannot consistently with justice and truth give them a sense of guilt for an action they never committed, so probably will not hold their souls in being merely to make them sensible of pain for the guilt of a remote ancestor, their existence in a state of everlasting insensibility (which was Dr. Ridgley's scheme) seems hardly intelligible; we must, therefore, either fall in with the above-mentioned hypothesis, or suppose them all to have a part in the resurrection to glory, which seems to put them all on a level, without a due distinction in favour of the seed of believers; or else must suppose they go through some new state of trial, concerning which the Scripture is wholly silent.

Such is the doctrine of original sin, both *inherent* and *imputed*, as some divines, eminent as scholars and theologians, have stated it. In proof of the degeneracy or depravity of human nature, they have appealed to observation and experience, and they have referred to a variety of texts of scripture, in which, according to their ideas of them, it is either implied or expressed. To those who object, that the

phenomenon of universal corruption in adult persons may be accounted for by imitation, and to want of early instruction, restraint, and discipline, they reply, that the scriptures seem to trace it to a higher source, and that children often manifest propensities towards those vices of which they have seen no examples; to which it is added, that there are many examples of eminent virtue in the world, and yet they are not so frequently, or so easily imitated, as those of a vicious nature, which plainly shews a bias on the mind towards vice. Hence they say, Pagans themselves, who have been most distinguished by their study of human nature, have acknowledged, in strong terms, an inward depravation and corruption adding a disproportionate force to evil examples, and rendering the mind averse to good. Those who maintain, that the sin of Adam is *imputed* to all who descended from him in the way of ordinary generation, allege, in proof of this opinion, that we are all born with such constitutions as will produce some evil inclinations, which we probably should not have had in our original state; which evil inclinations are represented in scripture as derived from our parents, and therefore may be ultimately traced up to the first sinful parents from whom we descended;—that infants are plainly liable to diseases and death, though they have not committed any personal transgression, which, while they cannot know the law, it seems impossible they should be capable of, (Rom. v. 12—14.);—that the seeds of diseases and death were undoubtedly derived to children from their immediate parents, and from them may be traced up to the first diseased and mortal parent, *i. e.* Adam;—that the scripture teaches us to consider Adam as having brought a sentence of death upon his whole race, and expressly says, that many were *constituted sinners*, *i. e.* on account of it are treated as such, (1 Cor. xv. 22. Rom. v. 12—19);—that the sin of Adam brought upon himself depraved inclinations, an impaired constitution, and at length death:—and there is no reason to believe, that if man had continued in a state of innocence, his offspring would have been thus corrupt, and thus calamitous from their birth. Hence, it has been inferred, that the covenant was made with Adam, not only for himself, but in some measure for his posterity; so that he was to be considered as the great head and representative of all that were to descend from him.

On the other hand, many divines, no less eminent as scholars and theologians, than those whose sentiments we have already stated, have disputed the validity of the arguments alleged in proof of the doctrine of original sin; and whilst some of them have disowned the doctrine *in toto*, as irrational and unscriptural, others have allowed that part of it which comprehends the depravity of the human species, but have rejected the imputation of Adam's sin to his posterity. Accordingly Limborch, rejecting and refusing the imputation of Adam's sin, acknowledges, that men are now born less pure than Adam was created, and with a certain inclination to sin; but this inclination cannot properly be called sin, or a habit of sin propagated to them from Adam; but merely an inclination to esteem and pursue what is agreeable to the flesh, arising from the bodily constitution transmitted to them by their parents. Inclinations and appetites of this kind, being most agreeable to the flesh, are contrary to the divine will, as God by prohibiting them tries the readiness of our obedience, and of course these inclinations are inclinations to sin. But, if it be asked, says this author, whether there be in human nature a certain original corruption or habit of sin propagated from Adam to his posterity, which may truly and properly be called sin, by which the understanding, and will, and all the affections

affections are so depraved, that they are inclined only to evil, and that all mankind are by nature subject to the wrath of God, such kind of corruption is consistent neither with scripture nor with right reason. The scripture, he says, teaches no such doctrine, as that which charges infants with a moral corruption, that is truly and properly sin. (See Deut. i. 39. Jonah, iv. 11. Romans, ix. 11.) Our Saviour recommends it to his disciples to be as little children. (See also 1 Cor. xiv. 20.) This notion, says Limborch, is contrary to the justice of God, who would not punish men with this moral corruption, from which all actual sins proceed, and which leads to future perdition and misery. God cannot be the author of sin. Besides, it cannot be conceived, how this sin can be propagated; it cannot belong to the mind, which proceeds immediately from God, nor can it exist in the body, which is incapable of sin. But as diseases may be propagated, so may a peculiar temperament or constitution, and together with this an inclination to certain objects, which, immoderately indulged, may become sinful, but is not sinful in itself. Moreover, no sin is liable to punishment, which is involuntary; but original corruption is involuntary. Limborch explains many texts, and refutes many arguments urged by the advocates of original sin. Another writer, (Dr. Taylor,) who has taken a lead in this controversy, on the same side of the question, proceeds, in the examination of the doctrine of original sin, upon the same plan with Dr. Clarke, in his "Scripture Doctrine of the Trinity," by citing and explaining all those passages of scripture which expressly speak of the consequences of the first transgression. He observes, that the consequences of the first transgression are spoken of certainly and plainly but five times in the whole bible, twice in the Old, and thrice in the New Testament. The first passage is Gen. ii. 17. In this passage, he says, death is opposed to life, and must be so understood. But not one word occurs in this text relating to Adam's posterity. 2. The consequences of the transgression of Adam and Eve are related in Gen. iii. from the 7th verse to the end of the chapter. The natural consequences were shame and fear, the common effects of guilt, which was personal, and could belong only to themselves. The judicial consequences pertained either to the serpent, the woman, or the man. As far as they relate to the man, Adam became obnoxious to death, which, as our author conceives, was death in law, or eternal death; and if the law had been immediately executed, his posterity then included in his loins must have been extinct. But it is alleged, that there is not a word of a curse upon the souls of our first parents, *i. e.* upon the powers of their minds; nor does the least intimation occur with respect to any other death, besides that dissolution which all mankind undergo, when they cease to live in this world. It is also observed, that we, their posterity, are in fact subject to the same afflictions and mortality here inflicted by sentence upon our first parents; but they are not inflicted as punishments for their sin, because punishment includes guilt; but we neither are, nor in the nature of things could be, guilty of their sin. We may suffer by their sin, and actually do suffer by it; but we are not punished for their sin, because we are not guilty of it; and this suffering is eventually a good. Accordingly it appears evident in our world, that the increase of natural evil (at least in some degree) is the lessening of moral evil.

3. The third text occurs in the New Testament, *viz.* 1 Cor. xv. 21, 22. Here it is said, the death from which all mankind shall be released at the resurrection, is the only death that came upon all men in consequence of Adam's sin; that as all men die, all men are mortal; all lose their

life in Adam, and from him our mortality commences; and it is equally undeniable, that by Christ came the resurrection of the dead. From this place we cannot conclude, says our author, that any other evil or death came upon mankind in consequence of Adam's first transgression, besides that death from which all mankind shall be delivered at the resurrection, whatever that death be.

4. The most difficult passage is that which occurs in Rom. v. 12—19. A popular advocate of the doctrine of original sin (Dr. Watts) thinks, that Adam's being a federal head, and our deriving a sinful nature from him, may be collected from this text. In this passage our author apprehends that the apostle is speaking of that death which takes place with regard to all mankind, when the present life is extinguished; and that by judgment to condemnation, or a judicial act of condemnation, the apostle means the being adjudged to the fore-mentioned death. The words "as by one man's disobedience many were made sinners," are (says Dr. Taylor) of the same signification with those in the foregoing verse, "as by the offence of one judgment came upon all men to condemnation;" and therefore they mean nothing more nor less than that by one man's disobedience, the many, that is, mankind, were made subject to death by the judicial act of God. The apostle, being a Jew, was well acquainted with the idiom of the Hebrew language; and according to that language, "being made sinners" may very well signify being adjudged or condemned to death. (See Exod. xxii. 9. Deut. xxv. 1. 1 Kings, viii. 32. Job, ix. 20. x. 2. xxxii. 3. xxxiv. 17. xl. 8. Pl. xxxvii. 33. xciv. 21. Prov. xvii. 15. If. l. 9. liv. 17.) In the Greek text it is not *γεννητο*, became sinners, but *καταδικαστηναι*, were constituted sinners; *viz.* by the will and appointment of the judge. Besides, it is here expressly said, that the many, *i. e.* mankind, are made sinners, not by their own disobedience, but by the disobedience of another man; and therefore they can be sinners in no other way than as they are sufferers. Upon the whole our author thinks it plain, that "by one man's disobedience many were made sinners," means that by Adam's offence, the many, *i. e.* mankind, were made subject to death by the judgment of God. In this passage there is an evident contrast or comparison between something which Adam did and its consequences, and something which Christ did and the consequences of that: by the former the many, *i. e.* all men, are brought into condemnation; and by the latter, all men are justified unto life. The whole of the apostle's argument and assertion are supposed by our author to rest upon two principles; *viz.* that it is by the one offence of Adam that death passed upon all men, and not by their own personal sins; and again, that it is by the obedience of one, or the one act of Christ's obedience, (in his sufferings and death upon the cross,) that all men are justified unto life, and not by their own personal righteousness. He adds, that throughout the whole paragraph, the apostle says nothing of any federal relations or transactions either on the part of Adam or Christ, nor of our deriving a sinful nature from Adam.

5. The text 1 Tim. ii. 14. declares a fact, with regard to Eve, which needs no explanation.

Dr. Taylor, in the second part of his book, proceeds to examine other passages of scripture, which some divines have applied to original sin. We shall here select two or three of the principal, that our readers may be able to form a judgment for themselves; one is Ephes. ii. 3. "and were by nature the children of wrath even as others." The apostle, our author apprehends, cannot mean that they were liable to divine wrath or punishment by that nature which they brought into the world at their birth. For this nature,

whatever infirmities belong to it, is no other than God's own work or gift; and he thinks, that to assert that the nature which God gives us is the hateful object of his wrath, is little less than blasphemy against our good and bountiful Creator. In his address to the Ephesians, the apostle is not speaking of their nature, or the natural constitution of their souls and bodies as they came into the world, but evidently of the vicious course of life they had led among the Gentiles. Nature frequently signifies an acquired nature, which men bring upon themselves by contracting either good or bad habits. Besides, by nature may here signify really, properly, truly; for *τεκνα*, children, strictly signify the genuine children of parents by natural generation; and figuratively the word denotes relation to a person or thing by way of friendship, regard, imitation, obligation, &c.; so that "children of wrath" are those who are related to wrath, or liable to rejection or punishment. The Ephesians, as the apostle tells them, were *τεκνα θυμῶν*, natural genuine children of wrath, not by natural birth, or the natural constitution of their bodies or souls, but they were related to wrath in the highest and strictest sense, with regard to sin and disobedience:—Nature, in a metaphorical expression, signifying that they were really and truly children of wrath, *i. e.* stood in the strictest and closest relation to suffering.

Another passage, sometimes referred to in connection with this subject, *viz.* Rom. viii. 7, 8, contains not so much as a single word that can carry our minds to Adam, or any consequences of his sin upon us.

Gen. vi. 5. expresses the universal wickedness of the old world, but does not so much as intimate that our nature is corrupted in Adam; for the historian doth not charge their sin in any way upon Adam, but upon themselves: and besides, Noah is exempted out of the number of the corrupt and profligate; but this could not have been the case if the alleged text is a good proof that by Adam's transgression the nature of all mankind is corrupted.

Another text, which has been considered as of great importance in this controversy, is Ps. li. 5, 6. "I was shapen in iniquity, and in sin did my mother conceive me." The word *הוֹלֵלְתִּי*, which we translate *shapen*, signifies, says our author, to bring forth or bear. (Is. li. 2. Prov. viii. 24, 25.) Again, the word *הִמְתֵּנִי* *conceived me*, properly signifies *warmed me*; and the expression conveys the idea, not of his being conceived, but warmed, cherished, or nursed by his mother, after he was born. Accordingly, the verse is thus translated, "Behold, I was born in iniquity, and in sin did my mother nurse me;" which has no reference to the original formation of his constitution, but is a periphrasis for his being a sinner from the womb, and is as much as to say, in plain language, I am a great sinner; or I have contracted habits of sin. This, it is said, is a scriptural way of aggravating wickedness. (See Ps. lviii. 3. Isaiah, xlviii. 8.) In the whole psalm there is not one word about Adam, or the effects of his transgression upon us. The psalmist is charging himself with his own sin. But if the words be taken in the literal sense of our version, then it is manifest that he chargeth not himself with his sin and wickedness, but some other person. But our limits will not allow of our enlarging farther in this way.

Dr. Taylor proceeds, in part iii. of his book, to examine and answer objections. It is asked, 1. Are we not in worse moral circumstances than Adam was? If by moral circumstances be meant the state of reason and virtue in the world, it is certain, that since Adam's first transgression, this has become very different from a state of innocence. But this is not the fault of human nature, no more than Adam's sin

was the fault of his nature, but occasioned, as his transgression was, by the abuse of it. If by moral circumstances be meant the provision and means which God has furnished for our spiritual improvement, the apostle to the Romans expressly affirms, that in or by Jesus Christ, God hath given us an abundance of grace. But if by moral circumstances be meant moral abilities, or mental powers, our author suggests, that there is no ground in revelation for exalting the nature of Adam to such a degree of purity and strength as some divines have raised it, when they affirm, that all his faculties were perfect, and entirely devoted to the love and obedience of his creator. The sequel of his history seems to be inconsistent with this notion.

It is said that man was made in the image of God; but can this be affirmed of his posterity? The image of God must be understood either of the rational faculties of his mind, or the dominion he had over the inferior creatures, by which he bore the nearest resemblance to God of any beings in this world; and not, as Dr. Taylor conceives, of holiness and righteousness, which is a right use of our spiritual faculties; because such an use of them could not be till after they were created; and this writer is of opinion, that original righteousness is as far from truth as original sin; and that to talk of our wanting that righteousness in which Adam was created, is to talk of nothing we want. Two texts, *viz.* Rom. ii. 14, 15, and Eccles. vii. 29, are cited by the Assembly of Divines in their larger Catechism, to prove, that our first parents had the law of God written in their hearts, and power to fulfil it, in opposition to their posterity, who want that righteousness in which they are supposed to have been created, and whose nature is corrupted to a lamentable degree: but if these texts speak not of our first parents, but of their posterity, and of the most corrupt part of their posterity too, it must be true, and the truth is very important, "that by nature we have the law of God written in our hearts, and power to fulfil it," as well as they; and are equally bound to be thankful to God for our being, and to glorify him by it.

We have already spoken of that moral taint and infection, which we are said to have derived from Adam; and in consequence of which we have a natural propensity to sin. This taint or infection must exist either in the body or the soul. In the soul, which immediately proceeds from God, it cannot exist; nor in the body, which, in a state separate from the soul, is inactive matter, which in itself neither is nor can be the subject of moral good and evil. But such an infection, wheresoever it exists, or howsoever it is propagated, cannot be derived from Adam to every human being, independently of the will and operation of God; and to assert, that it is by his will and operation, is evidently to make him the author of the pollution. It is maintained, that by propagation it is not possible for parents to communicate vice; which is always the faulty choice of a person's own will, otherwise it is not vice. Children, it has been said, begin very soon to sin, and how can this fact be accounted for but upon the scheme of original sin; namely, that it is infused into their nature? To this objection it has been replied, that their early sin is owing to the early want of instruction and discipline. Another objection, which is strongly urged by the advocates of original sin, is this: Adam was a common or federal head and representative of all his posterity, and consequently all his offspring sinned in him, as their root; just as Levi is said to pay tithes in Abraham (Heb. vii. 9.) and as the branches must be morally corrupt, if the root be in that state. (Rom. xi. 16.) To the arguments deduced from the first of these passages it has been replied, that neither the case of Abraham and Levi,

Levi, nor the apostle's argument grounded upon it, have any manner of relation to partaking in guilt, or contracting moral corruption : and it is alleged, that the inference deducible from the second passage would be very just, if the apostle were here speaking of moral holiness, of holiness, as it is a quality or principle in the mind : whereas the holiness here mentioned is said to be that external, relative holiness which is frequently attributed to the whole nation of the Jews, as they were God's peculiar church and people. The notion of a federal head or representative of moral conduct, a representative, the guilt of whose actions shall be imputed to us, and whose sin shall corrupt and debauch our minds, and this representative appointed by God himself, is, as its opponents maintain, not only without foundation in scripture, but in itself a great absurdity. Indeed, the external circumstances of posterity may be affected by the bad conduct of their ancestors. This is frequently affirmed in scripture, and certainly holds good in the case of Adam and his posterity ; and may be a constitution, just, wise, and answering very good purposes. But that any man should so represent me, that when he is guilty, I am to be reputed guilty, when he transgresseth, I shall be accountable and punishable for his transgression ; and this before I am born, and consequently before I am in any capacity of knowing, helping, or hindering what he doth ; this, I say, every one who uses his understanding must clearly see is false, unreasonable, and altogether inconsistent with the truth and goodness of God. And, if you please, you may see him fully vindicated by the spirit of truth from all injustice of this kind in Ezekiel, xviii. 20. where he affirms, "that the soul that sinneth, it shall die. The son," however he may come under disciplinary visitations, "shall not bear the iniquity of the father ; neither shall the father bear the iniquity of the son ; the righteousness of the righteous shall be upon him, and the wickedness of the wicked shall be upon him." And v. 30. "that God will judge every one according to his ways." It is further alleged, that the imputation of sin, so far as to make the posterity guilty of and chargeable with the sin of the parent, is no scriptural notion. An action, indeed, is often said to be imputed, reckoned, or accounted to a person ; but then it is no other than his own act and deed which is so accounted or imputed to him, either for righteousness or sin. See Gen. xv. 6. Lev. xvii. 3, 4. Num. xviii. 26, 27. 1 Sam. xi. 2. 1 Sam. xxii. 15. 2 Sam. xix. 19. Prov. xxvii. 14. Ps. xxxii. 2. Ps. cvi. 31. Rom. ii. 26. Rom. iv. 3, &c. Rom. v. 13. 1 Cor. xiii. 5. 2 Cor. v. 19. Gal. iii. 6. 2 Tim. iv. 16. James, ii. 23.

We might here introduce some arguments for, and some objections to, the doctrine of original sin, of a general nature, if our limits would allow. We can only suggest, on the part of its advocates, that original sin is necessary to account for the being of sin in the world. How comes it to pass, that there is so much wickedness in the world, if our nature be not sinful ?—How is it consistent with the justice of God, that we suffer at all on account of Adam's sin ? Besides, it has been a generally received opinion, that the fall, corruption, and apostasy in Adam, have been the reason why Christ came into the world, and gave himself a ransom for us. To the question concerning regeneration, which is insisted upon in the New Testament, why must we be born again ? it is replied, because we are born in sin. Our nature in Adam is corrupted, and utterly indisposed, disabled, and made opposite to all that is spiritually good, and wholly inclined to all evil, and that continually ; therefore we must be born again, before we can do any thing that is good and pleasing to God.

On the other hand, the opposers of this doctrine allege,

that it is highly injurious to the God of our nature to believe that our nature is originally corrupted in the manner which this doctrine supposes. To disparage our nature, is, they say, to disparage the work and gifts of God. They also suggest, that the doctrine of original sin teaches men to transfer their sin to a wrong cause, to Adam rather than to themselves ; and also that the doctrine, as it is commonly held, has a manifest tendency to propagate a notion that they must be necessarily vicious, and that it is thus destructive of virtue. They say, that to represent sin as *natural*, as altogether *unavoidable*, is to embolden men in sin, and to give not only an excuse, but a reason for sinning. They also intimate, that to charge Christianity with teaching this doctrine, is to sink its credibility ; and that it is injurious in another way, by perplexing the mind, and rendering all religious principles uncertain. "We are made," as one of them expresses it, "sinners we know not how, and therefore must be sorry for, and repent of, we know not what. We are made sinners in an arbitrary way, and we are made saints in an arbitrary way : but what is arbitrary can be brought under no rules." They think that it is not expedient or desirable to teach children, that they are born children of wrath, that they came into the world under God's curse, and that their being, as soon as given, is in the worst and most deplorable state of corruption. Young people are exhorted to remember their creator ; but how, it is said, can they remember him, without the utmost horror, who, it is supposed, hath given them life under such deplorable circumstances ?

We shall close this article with a brief account of the "Fall of Man," and its consequences, as they have been stated by different divines. Adam was created, as the Assembly of Divines affirm, after God's own image, in knowledge, righteousness, and holiness, having the law of God written in his heart, and power to fulfil it ; and for proof of this assertion, they refer to Gen. ii. 27. Col. iii. 10. Eph. iv. 24. Rom. ii. 14, 15. Eccl. vii. 29. This state of moral rectitude, or original righteousness, in which he was created, is thus described by Dr. Watts. "His reason was clear, and sense, appetite, and passion were subject to it, his judgment uncorrupted, his will had an inward, constant, superior bias, bent, and propensity to holiness and virtue ; he had an inward inclination to please and honour God, supreme love to his creator, a zeal and desire to serve him, a holy fear of offending him, with a readiness to do his will." When Adam sinned he lost this moral rectitude ; and not only so, but his posterity became morally corrupt. We have already stated the opinion of the opponents to the doctrine of original sin, concerning the moral condition of Adam before his fall. By the advocates of this doctrine, it is further maintained, that a covenant was made with Adam, as a public person, not for himself only, but for his posterity ; and therefore all mankind, descending from him by ordinary generation, sinned in him, and fell with him in that first transgression. (See Acts, xvii. 26. Gen. ii. 16, 17. compared with Rom. v. 12—20. 1 Cor. xv. 21, 22.) The Fall, it is said, brought mankind into a state of sin and misery. (Rom. v. 12. iii. 13.) And the sinfulness of that state into which man fell, consisteth in the guilt of Adam's first sin, the want of that righteousness in which he was created, and the corruption of his nature, &c. (See Rom. v. 12, 19. Rom. iii. 10, 20. Eph. ii. 1, 2, 3. Rom. v. 6. viii. 7, 9. Gen. vi. 5. James, i. 14, 15. Matt. xv. 19.) It is added, that the Fall brought upon mankind the loss of communion with God, his displeasure, and curse ; so that we are by nature children of wrath, bond-slaves to Satan, and justly liable to all punishments in this

this world, and in that which is to come. See Gen. iii. 8. 10. 24. Eph. ii. 2, 3. 2 Tim. ii. 26. Gen. ii. 17. Lam. iii. 39. Rom. vi. 23. Matt. xxv. 41. 46. Jude, v. 7.

On the other hand, it is alleged, that the language of man's sinfulness consisting in the guilt of Adam's first sin is unscriptural; nor, in the nature of things, can our sinfulness consist in the guilt of Adam's first sin; because, as we could not possibly commit that action in any sense, so we could not, upon account of it, become obnoxious to punishment. If the texts above cited prove that man's nature by Adam's sin is so corrupted, that man, *i. e.* men, are utterly indisposed, disabled, and made opposite to all that is spiritually good, that is, to all moral actions, pleasing and acceptable to God, and wholly and continually inclined to all manner of wickedness, they would further prove, that men are no moral agents, and that sin must be natural to us, and if natural, necessary; and if necessary, with regard to us, it is no sin, with regard to us, or so far as we are concerned in it. For a further account of the state of this controversy, and of the arguments adduced for and against the doctrine of original sin, we refer to the Assembly's Catechism; Watts's *Ruin and Recovery*; Jennings's *Vindication*, &c. Chandler's *Sermons*, vol. iv. Sermon. 1—7. Bury-Street Lect. vol. i. Limborch *Theolog. lib.* iii. c. 4. § 1, 2. Taylor's *Scripture Doctrine of Original Sin*, in Three Parts, with a Supplement, &c. ed. 4. Ben Mordecai's *Letters*, Letter V.

The Romish casuists distinguish *actual* sins into *mortal*; which are such as make us lose the grace of God; and *venial*, which alone are pardoned, as being only sins of infirmity, not of malice. See *POPERY*.

Divines are not yet agreed what the sin against the Holy Ghost is. See *BLASPHEMY against the Holy Ghost*.

SIN, *Philosophical*, according to the doctrine of the Jesuits, is an action, or course of action, that is repugnant to the dictates of reason, and yet not offensive to the Deity.

SINA, in *Ancient Geography*, a town of Asia, in Margiana. Ptolemy.—Also, a town of Cappadocia, in the prefecture of Cilicia. Id.—Also, a place in the isle of Lesbos. Strabo.

SINA, or *Justinianopolis*, a town of Asia, in the Greater Armenia.

SINAAB, in *Geography*, a town of Algiers, in the province of Tremecen, on the E. side of the Shelliff; 72 miles S.W. of Algiers.

SINACA, in *Ancient Geography*, a town of Hyrcania. Ptolemy.

SINADIZAVA, in *Geography*, a town of European Turkey, in Bulgaria, on the Ozma; 12 miles E. of Nicopoli.

SINÆ, in *Ancient Geography*, a people of India, according to Ptolemy. It appears that their country extended from Siam into a part of China.

SINAI, MOUNT, in *Geography*, a famous mount of Arabia Petraea, on which God gave the law to Moses. (Exod. xix. 1. xxiv. 16. xxxi. 18. xxxiv. 2. 4. &c. Levit. xxv. 1. xxvi. 46.) It is situated in a kind of peninsula, formed by the two arms of the Red sea, one extending N. called the gulf of Kolfun; the other extending E. called the gulf of Elan. The Arabs call mount Sinai by the name of "Tor," *i. e.* the mountain, by way of excellence; or "Jebbel Mufa," the mountain of Moses; comprehending a range of mountains which rises at the interior extremity of the valley of Fazan, restricting the name of Tor Sinai to that part of the range on which the convent of St. Catharine stands; and distant about 260 miles from Cairo. The wilderness of Sinai, where the

Israelites continued encamped almost a year, and where Moses erected the tabernacle of the covenant, is considerably elevated above the rest of the country; the ascent to it is very craggy, the greater part being cut out of the rock; and then you arrive at a large space of ground, which is a plain surrounded on all sides by rocks and eminences, whose length is nearly twelve miles. Towards the extremity of this plain, on the north, two high mountains appear, the highest of which is called Sinai, the other Horeb. They are both of a very steep ascent, and the ground on which they stand is inconsiderable, when compared with their height. Sinai is one-third part higher than the other, and its ascent more upright and difficult. The Greeks have cut a flight of steps up the rock. Pococke reckons 3000 of these steps to the top of the mountain, or rather bare, pointed rock. Two German miles and a half up the mountain stands the convent of St. Catharine. The body of this monastery is a building 120 feet in length, and almost as many in breadth. Before it stands another small building, in which is the only gate of the convent, and which remains always shut, except when the bishop is there. At other times, whatever is introduced within the convent, whether men or provisions, is drawn up by the roof in a basket, and with a cord and pulley. The whole building is of hewn stone, which, in such a desert, must have been constructed with great labour and expence. Within the walls is a small mosque for the convenience of the Arabs. This monastery belongs to Greek monks, who had in former times only a tower erected near the burning bush of Moses. But being molested by the insults and depredations of the Arabs, they petitioned the emperor Justinian to build for them a strong monastery for their future security; and the emperor is said to have complied with their request. Before the convent is a large garden, planted with excellent fruit-trees. According to the account of the Arabs, the monks enter it by a subterraneous passage. These Greek ecclesiastics are not allowed to receive an European visitor, without an order from the bishop of mount Sinai, who resides ordinarily at Cairo. When the bishop happens to be present, the gate is opened, and the convent must entertain all the Arabs who come in there; and this is a grievous charge on the poor monks, who live merely on alms, and whose provisions, which they are obliged to bring from Cairo, are often stolen by the way. The Arabs are, in general, very dangerous neighbours, as they often fire on the convent from the adjacent rocks; and seize the monks whenever they find them without the walls of the monastery, and refuse to release them without a considerable ransom.

Five hundred steps above the convent is found an excellent spring, which superstitious persons have counted miraculous, as the mountain is so high and so barren. A thousand steps higher stands a chapel dedicated to the Blessed Virgin; and 500 above this, are two other chapels, situated in a plain, which the traveller enters by two small gates of mason-work. Upon this plain are two trees, under which, at high festivals, the Arabs are regaled at the expence of the Greeks. Sinai is held in great veneration, on account of the law which God gave on this mountain. The whole mountain is a very remarkable rock of red granite, interspersed with spots, to which soil has been brought by human labour, or washed down by rain, and in which grow almond-trees, figs, and vines. Mount Horeb stands W. of Sinai, so that at sunrise the shadow of Sinai covers Horeb. Beside the little fountain at the top of Sinai, there is another at the foot of Horeb, which supplies the monastery of St. Catharine. At a small distance is shewn a stone, four or five feet high, and three broad, from which, it is pretended, Moses caused the

water

water to gush out: in this stone are twelve holes or channels, about a foot wide, from which, it is said, the water issued which the Israelites drank.

SINAI, *Knights of*. See CATHARINE.

SINALOA, in *Geography*. See CINALOA.

SI-NAN, a river of Algiers, which joins the Wed-el-Mailah, about five miles before it runs into the sea. It glides in a variety of beautiful windings, and is known by several names, according to the remarkable places which they water. Near the banks of this river, Barbarossa the Elder scattered his treasures when pursued by the victorious Spaniards, and here he made his last ineffectual effort to retard their progress.

SINANELLY, a town of Hindoostan, in Myfore; 22 miles S.W. of Bangalore.

SINAPATINGA, in *Ancient Geography*, a town of India, on this side of the Ganges, in the vicinity of the river Indus, and one of those which belonged to the Cathæi, according to Ptolemy.

SINAPIS, in *Botany*, a generic name, whose origin is lost in the obscurity of antiquity, which occurs, with slight variations in its orthography, in the works of Plautus, Pliny, and Columella. Theophrastus and Dioscorides call it Σινάπις. It is also met with under the terms σινάπις and ναπις; παρὰ τὴν σινάπιν τοὺς ὀφθαλμοὺς, from its pungency affecting the eyes. De Theis, much inclined on all occasions to recur to the Celtic, conjectures that this word comes from *Nap*, a general name in that language for all plants allied to the Radish.—Linn. Gen. 342. Schreb. 445. Willd. Sp. Pl. v. 3. 554. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 721. Prodr. Fl. Græc. Sibth. v. 2. 31. Ait. Hort. Kew. v. 4. 125. Tournef. t. 112. Jul. 238. Lamarck Illustr. t. 566. Gærtn. t. 143.—Class and order, *Tetradynamia Siliquosa*. Nat. Ord. *Siliquosa*, or *Cruciformes*, Linn. *Cruciferae*, Juss.

Gen. Ch. *Cal.* Perianth inferior, spreading, divided into four, linear, concave, channelled leaves, forming a cross, deciduous. *Cor.* cruciform; of four, rounded, flat, spreading, undivided petals, with erect, linear claws scarcely the length of the calyx. Nectary composed of four ovate glands, one on each side between the shorter stamen and the pistil; and one on each side between the longer stamen and the calyx. *Stam.* Filaments six, awl-shaped, erect; the two shorter ones opposite; anthers erect, spreading, pointed. *Pist.* Germen superior, cylindrical; style the length of the germen, and height of the stamens; stigma capitate, undivided. *Peric.* Pod oblong, inflated unequally at the lower part, rough, of two cells and two valves; partition generally twice as long as the valves, large, compressed. *Seeds* numerous, globular.

Obs. *Sinapis* differs principally from *Brassica* in having a spreading calyx, and the claws of the petals erect. Crantz unites this genus with *Raphanus*.

Ess. Ch. Calyx widely spreading. Claws of the petals straight. Nectariferous glands four. Pod more or less cylindrical, the partition longer than the valves.

1. *S. arvensis*. Wild Mustard or Charlock. Linn. Sp. Pl. 933. Fl. Brit. n. 1. Engl. Bot. t. 1748. Curt. Lond. fasc. 5. t. 47. Fl. Dan. t. 753.—Pods with many angles, rugged, longer than their own two-edged beak. Leaves ovate, somewhat lyrate.—One of the most common and most troublesome European weeds in heavy moist corn lands, as well as about waste ground and hedges. It flowers most commonly in May and June, but occasionally in all open weather. *Root* annual, spindle-shaped, small, rigid. *Stem* round, striated, hispid with slightly deflexed bristles, tinged with red. *Leaves* alternate, stalked, ovate, rough,

unequally toothed; lower ones somewhat lyrate; upper sessile. *Flowers* in a terminal, clustered corymb, of a bright yellow colour. *Seeds* extremely pungent, well known under the name of Durham-Mustard.

2. *S. orientalis*. Oriental Mustard. Linn. Sp. Pl. 933. Amœn. Acad. v. 4. 280. Ait. n. 2. “Schkuhr. handb. v. 1. 264. t. 186.” (*Sinapi orientale maximum, rapi folio*; Tourn. Cor. 17.)—Pods rough with reflexed bristles, and four blunt angles, compressed at the tip.—Native of the Levant, and introduced at Kew by M. Thouin in 1778, where it flowers in June and July. This *annual* is extremely like the last, from which indeed it differs merely in having the *pods* rough with reflexed bristles, the *beak* only being smooth.

3. *S. brassicata*. Cabbage Mustard. Willd. n. 3. Loureir. Cochinch. 399.—Leaves obovate, smooth, toothed in a diminutive manner.—Native of China, where it is much cultivated. This plant, we are informed by Loureiro, has the habit of Cabbage or Lettuce, but in the structure of its calyx it resembles Mustard. *Stem* a foot and half high, very smooth. *Radical-leaves* oleraceous, obtuse, white-veined, on channelled stalks; *stem-leaves* oblong, mostly with two auricled appendages at the base of the stalk, upper ones sessile, lanceolate, embracing the stem. *Flowers* like those of the Common Cabbage, bright yellow. *Pod* also resembling that of *Brassica oleracea*.

4. *S. alba*. White Mustard. Linn. Sp. Pl. 933. Fl. Brit. n. 2. Engl. Bot. t. 1677. Curt. Lond. fasc. 5. t. 46. Mart. Ruft. t. 70.—Pods bristly, rugged, shorter than their own two-edged beak. Leaves pinnatifid.—Common in fields and by road-sides, flowering from June to August. The *root* and *stem* of this *annual* are like those of the first species. *Lower leaves* deeply pinnatifid; *upper* somewhat lyrate; all of them irregularly toothed and rough. *Flowers* yellow. *Pods* on nearly horizontal stalks, ribbed, with a very long, sword-shaped beak. *Seeds* large, globose, pale yellowish, occasionally black.

5. *S. nigra*. Common Mustard. Linn. Sp. Pl. 933. Fl. Brit. n. 3. Engl. Bot. t. 969. Woodv. Med. Bot. t. 151. Mart. Ruft. t. 51.—Pods smooth, square, compressed to the stem. Upper leaves linear-lanceolate, entire, smooth.—A most common weed on hedge banks, waste ground, and the borders of fields, flowering in the midst of summer. *Root* annual, small. *Stem* much branched, spreading, round, smooth. *Leaves* stalked, irregularly lobed and toothed; radical ones rough; those of the stem and branches smooth and pendulous; the upper ones deflexed, entire, narrow. *Flowers* numerous, small, bright yellow. *Seeds* several, round, smooth, brown, furnishing “our common table mustard, one of the most useful and wholesome of stimulants, both in cookery and medicine.”

6. *S. pyrenaica*. Pyrenean Mustard. Linn. Sp. Pl. 934. Allion. Pedem. t. 55. f. 1.—Pods striated, scabrous. Leaves runcinate, smooth.—Native of the Pyrenées, Mount Cenis, and similar situations in the south of Europe. It flowers about June. *Root* biennial. *Stem* angular, even, striated, wavy, smooth. *Leaves* runcinate; segments of the lower or radical ones toothed; those of the stem lanceolate. *Flowers* clustered, small, yellow. Willdenow considers *S. maritima* of Allioni as a variety of this species.

7. *S. pubescens*. Downy Mustard. Linn. Mant. 95. Prodr. Fl. Græc. n. 1580. Arduin. Spec. v. 1. 21. t. 9.—Pods downy, erect, with a compressed beak. Leaves lyrate, villous.—Native of Sicily, flowering in June and July. *Stem* perennial, shrubby. *Leaves* obtuse. *Flowers* yellow, with undivided petals. *Pods* erect, hairy, or very downy, as indeed are all the parts of the plant.

8. *S.*

SINAPIS.

8. *S. hispid.* Hispid Mustard. Willd. n. 8.—Pods hispid, erect. Leaves lyrate, extremely rough. Stem hispid.—Native of Morocco. Root annual. Stem muricated with hairs. Leaves on stalks, pinnatifid, obtuse, toothed, the terminal lobe oblong, very large, exceedingly rough with short, rigid hairs. Flowers yellow. Pods terminating in a long, obtuse, flat beak.

9. *S. chinensis.* Chinese Mustard. Linn. Mant. 95. Willd. n. 9. Arduin. Spec. v. 1. 23. t. 10.—Pods smooth, slightly jointed, spreading. Leaves lyrate, or runcinate, somewhat hairy.—Native of China and Cochinchina, where it is extensively cultivated. It flowers in June and July. Root annual. Stem three feet in height, striated, branched. Radical-leaves stalked, large, wrinkled. Flowers whitish or yellow, in long, aggregate clusters.

10. *S. juncea.* Fine-leaved Mustard. Linn. Sp. Pl. 934. Jacq. Hort. Vind. v. 2. 80. t. 171.—Branches fasciculated. Upper leaves lanceolate, entire.—Native of Asia and China, flowering in the summer. Root annual, fibrous, whitish. Stem erect, branched, two feet high, smooth. Radical-leaves stalked, pinnatifid at the base, unequally serrated; upper lanceolate or oblong, sessile. Flowers yellow, in clusters, with the same pungency of smell as Common Mustard.

11. *S. Allionii.* Allioni's Mustard. Willd. n. 11. Jacq. Hort. Vind. v. 2. 79. t. 168.—Pods ovate-oblong, spreading. Leaves pinnatifid; segments jagged.—Native of Austria? It flowers in July. Root annual, white, fibrous. Stem solitary, round, generally smooth, but occasionally besprinkled with a few whitish hairs. Leaves jagged in a pinnatifid manner; the upper ones sessile; lower stalked. Flowers yellow, thinly scattered over upright clusters, nearly without scent.

12. *S. erucoides.* Dwarf Mustard. Linn. Sp. Pl. 934. Willd. n. 12. Jacq. Hort. Vind. v. 2. 80. t. 170.—Pods smooth, equal. Leaves lyrate, oblong, smooth. Stem smooth.—Native of the south of Europe, in vineyards and by way-sides, flowering in June and July. Root annual. Stem eight or nine inches high, purplish, a little angular. Leaves much jagged, yellowish-green. Flowers white, in loose spikes.

13. *S. cernua.* Pendulous Mustard. Willd. n. 13. Thunb. Japon. 261.—Pods smooth, spreading. Radical-leaf lyrate, the terminal lobe very large, ovate, cut and toothed.—Native of Japan and China. Root annual. Whole plant smooth. Stem furrowed, branched at the upper part. Flowering branches pendulous. Flowers white, in terminal clusters.

14. *S. japonica.* Japanese Mustard. Willd. n. 15. Thunb. Japon. 262.—Pods smooth, erect. Leaves jagged in a pinnatifid manner, smooth.—Native of Japan, about Jedo, flowering in May. Whole plant smooth. Stem herbaceous, erect, furrowed, branched. Leaves stalked, the upper ones less deeply pinnatifid, often toothed at the tip. Flowers yellowish, in very long clusters.

15. *S. incana.* Hoary-jointed Mustard. Linn. Sp. Pl. 934. Amœn. Acad. v. 4. 280. Jacq. Hort. Vind. v. 2. 79. t. 169.—Pods with two joints, erect. Leaves bipinnatifid; segments linear.—Native of France, Spain, Portugal, and Switzerland. It flowers in July. Root biennial, branched, acrid, having the taste and smell of *Brassica Napus*. Stem branched, hispid. Leaves on long stalks, lyrate, very hairy and hoary. Flowers small, yellow, in terminal, axillary clusters.

16. *S. frutescens.* Shrubby Mustard. Willd. n. 17. Ait. Hort. Kew. n. 11.—Pods linear, smooth. Lower-leaves oblong, toothed; upper lanceolate, undivided. Stem

smooth, shrubby.—Native of Madeira, whence it was introduced at Kew by Mr. F. Masson in 1777. It flowers from December to June. Figure and description wanting.

17. *S. radicata.* Long-rooted Mustard. Willd. n. 18. Desfont. Atlant. v. 2. 98. t. 167. Prodr. Fl. Græc. n. 1581. Fl. Græc. t. 648, unpublished.—Pods awl-shaped, torulose, spreading. Radical-leaves deeply lyrate, hispid. Stem-leaves pinnate. Branches twiggy, smooth.—Native of uncultivated hills at Algiers, and in Greece. Roots very long, tortuous, branched, thread-shaped. Stem hispid below, smooth above, erect, branched. Lower-leaves stalked, their segments alternate, remote, obtuse, unequally toothed: upper with lanceolate, acute, entire or toothed, segments. Flowers pale yellow, very like those of *S. juncea*.

18. *S. levigata.* Smooth Mustard. Linn. Sp. Pl. 934. Amœn. Acad. v. 4. 281. (Erysimi varietas; Herman. Parad. 155.)—Pods smooth, spreading. Leaves lyrate, smooth; upper ones lanceolate. Stem smooth.—Native of Spain and Portugal, flowering in June and July. Root annual or biennial. Stem and leaves remarkably smooth. Flowers large, yellow.

The Linnæan *S. hispanica*, a rare and little-known plant, Ait. n. 15, is removed to Desfontaines' new genus *Cordylorcarpus*, in Prodr. Fl. Græc. v. 2. 33.

Mr. Brown, in Hort. Kew. has, after Tournefort's example, considered *Sisymbrium tenuifolium* and *murale* of Linnæus as species of *Sinapis*. See SISYMBRIUM.

SINAPIS, in Gardening, contains plants of the hardy, herbaceous, annual kind, of which the species cultivated are, the white mustard (*S. alba*); and the common or black mustard (*S. nigra*).

The first sort is generally cultivated in gardens as a salad herb, with cresses, radishes, rape, &c. for winter and spring use; in which intention it is a highly valuable plant.

In the second sort, it is the flour of the seed that affords the common mustard for the table.

Method of Culture.—The first sort is sown along with other small salad herbs, at all times of the year, sometimes every week or fortnight, in a bed or border of light earth, sown generally in shallow drills very thick, covering it very thinly with earth; and in winter, and early in spring, during cold weather, in hot-beds. The herbs are always cut for use whilst in the seed-leaf, and but a few days old; otherwise they become too strong and rank-tasted for use. See SALLAD Herbs, and SMALL Sallad Herbs.

But in order to have seed of this sort for garden use, it should be sown on an open spot of ground, in March or April, either thinly in drills a foot asunder, or broad-cast all over the surface, and the plants be left to run up to stalk, when they will furnish ripe seeds in August. And in order to raise the plants for the seed for mustard, the seeds should be sown in the spring, any time in March, in some open situation, either in the kitchen-garden, or in open fields. In either case, having dug or ploughed the ground, the seed should be sown broad-cast all over the surface, and raked or harrowed in lightly; or it may be sown in shallow drills a foot asunder, and be slightly covered in. The plants soon come up; and when they have four or more leaves an inch or two broad, if they stand very thick, those sown in the broad-cast way particularly should be hoed and thinned, leaving them six or eight inches asunder, cutting up all weeds; repeating the operation once or more, if necessary. After this the plants will soon spread and cover the ground, and shoot fast up to stalks for flowers and seed, which ripens in July or August, when the stalks should be cut or pulled up, and the seed, being properly hardened,

and

and dried in the pod, should either be thrashed out directly, or stacked up dry, and thrashed at occasional opportunities afterwards; but the first is the best method.

SINAPIS Nigra, *Common Black Mustard*, in the *Materia Medica*, &c. is common in corn-fields and banks of ditches, but is cultivated for use, and flowers in June. (See *SINAPIS* and *MUSTARD*.) The seeds of this species of mustard, which are directed by the London College, and those of the *S. alba*, which are preferred by that of Edinburgh, are not different in taste or their general effects, and answer equally well for the table and for medical purposes. Their taste is acrid and pungent, and when bruised this pungency becomes volatile and affects the smell: they readily impart these qualities to aqueous liquors, and by distillation with water yield an essential oil of great acrimony; but to rectified spirits they give out very little either of their smell or taste. When subjected to the press, they yield a considerable quantity of mild insipid oil, which is as free from acrimony as that of almonds. By writers on the *materia medica*, mustard is considered as promoting appetite, assisting digestion, attenuating viscid juices, and by stimulating the fibres, proving a general remedy in paralytic and rheumatic affections. In considerable quantity, it opens the body and increases the urinary discharge, and hence has been found useful in dropical complaints. In these affections, perhaps, the best mode of exhibiting mustard, is in the form of whey, which is made by boiling 3iv of the bruised seeds in oj of milk, and straining to separate the curd. A fourth part of this quantity may be taken for a dose three times a day. It has also been recommended as an antiscorbutic; though Haller says that the use of mustard disposes the humours to putrefaction, to which opinion he was probably inclined by the supposition that it contained volatile alkali; but it has been found that vegetables reckoned among the alkalescent plants may be so directed by fermentation as to be of the acrescent kind, and the alkali obtained from them seems not to have existed in the vegetable in a separate state. The great pungency of these plants is therefore not to be ascribed to the volatile alkali, but to the essential oil which they contain. Bergius informs us, that he found mustard of great efficacy in curing vernal intermittents; for which purpose he directed a spoonful of the whole seeds to be taken three or four times a day, during the apyrexia; and when the disease was obstinate, he added flour of mustard to the bark. Externally these seeds are frequently used as a stimulant or sinapism. The flour rubbed on the skin, or applied in the form of a cataplasm, made into a paste with crumbs of bread and vinegar, soon excites a sense of pain, considerable inflammation, and sometimes vesication. In these forms it has been found serviceable in paralysis, and applied to the soles of the feet in the delirium of typhus, and in comatose affections. It is observed by Cullen that the fresh powder of mustard shews little pungency and much bitterness; but when it has been moistened with vinegar, and kept for a day, the essential oil is evolved, and it becomes considerably more acrid, as is well known to those who prepare mustard for the table; a circumstance which should be attended to when designed for external use. Mustard-feed may be most conveniently given entire or unbruised, and to the quantity of a spoonful or half an ounce for a dose. The constituents of mustard-feed appear to be starch, mucus, a bland fixed oil, an acrid volatile oil, and an ammoniacal salt. The official preparations of mustard are "cataplasma sinapis," L. D. and "emplastrum meloes compositum," E. See *PLASTER*.

The cataplasm of mustard of the Lond. Ph. is prepared by mixing mustard-feed and lint-feed, of each in powder half a pound, with a sufficient quantity of hot vinegar, to

the thickness of a cataplasm. The mustard cataplasm of the Dub. Ph. is formed of mustard-feed in powder and crumb of bread, of each half a pound, and a sufficient quantity of vinegar. This preparation may be rendered more acrid by adding two ounces of horse-radish finely scraped. These cataplasms are powerful local stimulants and rubefacients. They are to be spread on cloth to the thickness of about half an inch, and applied to the soles of the feet, in the low stage of typhus fever, particularly when stupor or delirium is present, and in apoplexy, coma, and other cases in which there is a great determination to the head. Their rubefacient effects are very quickly produced, and often so powerfully as to raise blisters on the part. Cullen's *Mat. Med.* Woodv. *Med. Bot.* Thomson's *Lond. Disp.*

SINAPI Persicum, *Persian Mustard*, a name by which some botanical authors have called the thlaspi, or treacle mustard.

SINAPISIS, a word used by some writers as a name for Armenian bole.

SINAPISM, *σιναιπισμος*, formed from *sinapi*, or *σινωπι*, *mustard-feed*, in *Pharmacy*, an external medicine, in form of a cataplasm. See *SINAPIS*.

SINAPISTRUM, in *Botany*, Tourn. *Inst.* 231. t. 116, a name of Hermann's, alluding to the resemblance of the plant, or at least of its pods, to *Sinapis*, or Mustard. See *CLEOME*.

SINARA, the name of the male dancers, who, according to the mythology of the Hindoos, amuse their god Indra, regent of the firmament. (See *INDRA*.) These are perhaps the same beings whose name is sometimes written Cinnara, and described to be human figures with the head of a horse, but we never saw them so represented. See *SITANTA* and *SURA*.

SINARUM REGIO, in *Ancient Geography*, a country of Asia, and the last on the eastern coast, according to Ptolemy.

SINARUS, a river of India, which discharges itself into the Hydaspes, according to Arrian.

SINASBARIUM, in *Botany*, a name given by some authors to the sisymbrium, or water-mint, common in all our ditches and watery places.

SINASSE, in *Geography*, a town of Abyssinia; 40 miles N.E. of Miné.

SINAY, a small island near the W. coast of the island of Luçon. N. lat. 18° 11'. E. long. 120° 36'.

SINBACH, or *SIMPACH*, a town of Bavaria; 5 miles S. of Landau.

SINCAPOURA, or *SINCAPURA*, an island, with a town of the same name, near the S. coast of Malacca, which gives name to the narrow sea, called the "Straits of Sinca-poura." N. lat. 1° 12'. E. long. 103° 30'.

SIN-CARPOU, a town of Chinese Tartary; 555 miles E.N.E. of Peking. N. lat. 41° 23'. E. long. 126° 46'.

SINCERITY, in *Ethics*, is that excellent habitude and temper of mind, which gives to virtue its reality, and makes it to be what it appears. *Simplicity*, called by the Greeks *απλοτης*, is included in this virtue, but does not express the whole of it; so that it is necessary to add *αληθεια*, *truth*: of which two the first stands in opposition to what is mixed and adulterated; the other to what is counterfeit. *Sincerity* has respect to two sorts of objects; persons and things. Of the first kind are God; other men, and every man's self. Sincerity, with regard to God, signifies, that the form of religion is accompanied with the power of it, and that piety and obedience are substantial and unaffected; proceeding from principles, right in themselves, and uniform in their influence. Sincerity, as it regards men, implies an honesty

and openness in our dealings with them, extending to the springs and motions of our actions, as well as the actions themselves; to our words and our thoughts. Sincerity, with relation to a man's self, is opposed to self-deception. As to things, truth and goodness are the principal objects of sincerity. The extremes of this virtue are over-frankness and hypocrisy. Grove's System of Moral Philosophy, vol. ii. ch. 3.

SINCHO, or CHINCO, in *Geography*, a town of Africa, in the kingdom of Ningo, on the Gold Coast, the inhabitants of which are chiefly employed in fishing.

SINCIPUT, in *Anatomy*, the fore-part of the head, in opposition to occiput.

SINCKEL, in *Geography*, a river of Bavaria, which joins the Wertha; 2 miles S.S.W. of Augsburg.

SINCLAIR. See ST. CLAIR.

SIND, in *Agriculture*, provincially to rinse or wash out, as a milking pail, dish, &c.

SINDA, in *Ancient Geography*, a town of India, on the other side of the Ganges, placed by Steph. Byz. on the coast of the great gulf between Corgatha and Pagrafa.—Also, a town of Asia, in Pisidia, on the confines of Caria. Strabo.—Also, a town of Asiatic Sarmatia, upon the Cimmerian Bosphorus, between the ports Sindicus and Bara, according to Ptolemy.

SINDA, in *Geography*, a town of Hindoostan, in Baglana; 20 miles N.W. of Nassuck.

SINDÆ, in *Ancient Geography*, the name of three islands in the Indian sea, S. of the Baruffæ, according to Ptolemy.

SINDAGUA, in *Geography*, a ridge of mountains in South America, between Popayan and the Pacific ocean.

SINDANGAN BAY, a bay on the N.W. coast of Mindanao, extending from N. to S. about 100 miles. N. lat. $8^{\circ} 15'$. E. long. $123^{\circ} 5'$.

SINDE. See INDUS.—Also, a river of Hindoostan, which rises about 20 miles W. of Bilsah, and runs into the Jumnah, at Putterahee.

SINDEJUA, a town of Napaul; 40 miles W. of Mo-caumpour.

SINDELFINGEN, a town of Wurtemberg; 6 miles S.W. of Stuttgart. N. lat. $48^{\circ} 41'$. E. long. $8^{\circ} 52'$.

SINDER, a town of Hindoostan, in Baglana; 15 miles S.E. of Nassuck.

SINDERINGEN, a town of Germany, in the county of Hohenlohe, on the Kocher; 12 miles N.E. of Heilbron. N. lat. $49^{\circ} 16'$. E. long. $9^{\circ} 33'$.

SINDESSUS, in *Ancient Geography*, a town of Asia Minor, in Caria. Steph. Byz.

SINDI, a people of Asiatic Sarmatia, in the number of those who inhabited the Cimmerian Bosphorus. Strabo.

SINDIA, a town of Asia Minor, in Lycia. Steph. Byz.

SINDIANI, a Scythian people who inhabited the vicinity of the Palus Mæotis, according to Lucian.

SINDICUS PORTUS, a port of Asiatic Sarmatia, on the coast of the Cimmerian Bosphorus, according to the Periplus of Scylax.

SINDINICES, a people of Germany, who formed a part of the nation of the Vandals.

SINDION, in *Geography*, a town of Egypt, on the W. branch of the Nile; 14 miles S.S.E. of Rosetta.

SINDITE, in *Ancient Geography*, a town of Lesser Armenia, in the prefecture of Mauriana. Ptolemy.

SINDKEERA, in *Geography*, a town of Hindoostan, in the circar of Naderbar; 15 miles W. of Tolnani.

SINDOCANDA, in *Ancient Geography*, a town placed by Ptolemy on the W. coast of the isle of Taprobana, between the mouth of the river Soana and the port Priapius.

SINDOLE, in *Geography*, a town of Hindoostan, in Orissa; 15 miles N. of Sonepour.

SINDOMANA, in *Ancient Geography*, a town of India, and the capital of the territories of Musicanus. Arrian.

SINDON, in *Scripture History*, a word properly signifying a shroud, and used by the evangelists to denote the linen cloth in which Joseph of Arimathea wrapped the body of Jesus, after its embalment, &c. (Matth. xxvii. 59. Mark, xv. 46. Luke, xxiii. 53. John, xx. 7.) Sindon is also mentioned in the history of Samson. (Judges, xiv. 12, 13.) The virtuous woman mentioned by Solomon (Prov. xxxi. 24.) made findons and girdles, which she sold to the Phœnicians. The young women of Jerusalem wore findons. (See Is. iii. 23.) This was a fashion peculiar to the Sidonians and the Phœnicians, and perhaps the name was derived from the city of Sidon. Martial says, that the findon of Tyre, or Phœnicia, covers a man all over, and puts him in a condition to despise rain and wind.

“ Ridebis ventos, hoc munere tectus, et imbres

Nec sic in Syria Sindone tectus eris.” Mart. l. iv. ep. 19.

The young man who followed Jesus Christ on the night of his passion, “amictus sindone super nudo,” was probably thus defended against the cold, as by a night-gown. Mark, xiv. 51.

SINDON, in *Surgery*, a little round piece of linen, or silk, or lint, used in dressing the wound after trepanning. The first thing usually done after the operation of trepanning is, to pour a few drops of white balsam on the dura mater; then a spoonful of mel rosatum being warmed with a little balsam, a findon is dipped into it, of fine linen cloth: this is immediately applied upon the dura mater; and being greater than the hole in the skull, its circumference is thrust all round between the cranium and the membrane; then pledgets of lint are applied, and the hole is quite stopped with it. The next morning, when the dressing is taken off, the brain is never left bare a moment; but as soon as the former findon and lint are removed, new ones are clapped on in their room.

SINDOS, in *Ancient Geography*, a town of Mygdonia, a country of Macedonia, W. of Therma, between this town and the mouth of the Axios. It is called by Steph. Byz. Sinthos.

SINDOURCOTTY, in *Geography*, a town of Thibet, on the left bank of the Ganges; 48 miles S. of Gangotri.

SINDRY, a town of Bengal; 45 miles S.E. of Nattore.

SINDSCAR, or SINDA, a town of Asiatic Turkey, in the government of Mosul; 30 miles S. of Mosul.

SINDY. See SCIND.



